

# **NOTICE**

**All drawings located at the end of the document.**

# ANNUAL UPDATE

*August 1, 2001, through August 1, 2002*

## Historical Release Report

Prepared by  
Kaiser-Hill Company, L.L.C.

Revision 0



ADMIN RECORD

ADMIN RECORD

SW-A-004672

1/185

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## ABBREVIATIONS, ACRONYMS, AND INITIALISMS

AL	action level
ALF	Action Level and Standards Framework for Surface Water, Groundwater & Soils
AME	Actinide Migration Evaluation
AOC	Area of Concern
AR	Administrative Record
ARA	accelerated response action
bgs	below ground surface
BTEX	benzene, toluene, ethylbenzene, and xylene
BZ	Buffer Zone
CAD/ROD	Corrective Action Decision/Record of Decision
CDPHE	Colorado Department of Public Health and Environment
CEARP	Comprehensive Environmental Assessment and Response Program
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CHWA	Colorado Hazardous Waste Act
Ci	curie
cm <sup>2</sup>	square centimeter
CPIR	Contingency Plan Implementation Report
cpm	counts per minute
D&D	decontamination and decommissioning
DDCP	Decontamination and Decommissioning Characterization Protocol
DNAPL	dense nonaqueous phase liquid
DOE	U S Department of Energy
dpm	disintegrations per minute
dpm/kg	disintegrations per minute per kilogram
dpm/L	disintegrations per minute per liter
DQO	data quality objectives
EG&G	EG&G Rocky Flats, Inc
EPA	U S Environmental Protection Agency
ER	Environmental Restoration
ERA	Ecological Risk Assessment
FIDLER	Field Instrument for the Detection of Low-Energy Radiation
FIFRA	Federal Insecticide, Fungicide, and Rodenticide Act
ft	foot/feet
ft <sup>2</sup>	square feet
FY	Fiscal Year
g	gram
GPR	Ground Penetrating Radar
GPS	Global Positioning System
HDPE	high density polyethylene
HEPA	high-efficiency particulate air
HHRA	Human Health Risk Assessment
HI	hazard index

## ABBREVIATIONS, ACRONYMS, AND INITIALISMS

HPGe	High Purity Germanium
HRR	Historical Release Report
HSA	Historical Site Assessment
IA	Industrial Area
IAG	Interagency Agreement
IASAP	Industrial Area Sampling and Analysis Plan
IDM	investigative derived materials
IHSS	Individual Hazardous Substance Site
IM/IRA	Interim Measure/Interim Remedial Action
IMP	Integrated Monitoring Program
IRIS	Integrated Risk Information System
ITS	Interceptor Trench System
IWCP	Integrated Work Control Package
K-H	Kaiser-Hill Company, L L C
$\mu\text{Ci/g}$	microcuries per gram
$\mu\text{g/kg}$	micrograms per kilogram (ppb)
$\mu\text{g/L}$	micrograms per liter (ppb)
MDL	method detection limit
$\text{mg/kg}$	milligrams per kilogram (ppm)
$\text{mg/L}$	milligrams per liter (ppm)
$\text{mg/m}^3$	milligrams per cubic meter
MH	manhole
mr/hr	millirem per hour
MST	modular storage tank
M and TE	measuring and testing equipment
nCi/g	nanocuries per gram
NFA	No Further Action
NPWL	New Process Waste Lines
NRC	National Response Center
NTS	Nevada Test Site
OPWL	Original Process Waste Lines
OU	Operable Unit
PA	Protected Area
PAC	potential area of concern
PAM	Proposed Action Memorandum
PARCC	precision, accuracy, representativeness, completeness, and comparability
PCB	polychlorinated biphenyl
PCE	tetrachloroethene
pCi/g	picocuries per gram
PCOC	potential contaminant of concern
pg/g	picograms per gram
PIC	Potential Incident of Concern
POC	Point of Compliance
POE	Point of Evaluation

## ABBREVIATIONS, ACRONYMS, AND INITIALISMS

ppb	parts per billion ( $\mu\text{g/kg}$ or $\mu\text{g/L}$ )
ppm	parts per million ( $\text{mg/kg}$ or $\text{mg/L}$ )
PPRG	Programmatic Preliminary Remediation Goal
PSZ	Perimeter Security Zone
PU&D	Property Utilization and Disposal
QC	quality control
RCRA	Resource Conservation and Recovery Act
RCRA 3004(u)	Appendix 1, Waste Management Units RCRA Part B Permit Application
RFCA	Rocky Flats Cleanup Agreement
RFETS	Rocky Flats Environmental Technology Site
RFFO	Rocky Flats Field Office
RFI/RI	RCRA Facility Investigation/Remedial Investigation
RFP	Rocky Flats Plant
RI	Remedial Investigation
RLCR	Reconnaissance-Level Characterization Report
RMRS	Rocky Mountain Remediation Services, L L C
RQ	reportable quantity
RSAL	radionuclide soil action levels
RSOP	RFCA Standard Operating Protocol
SAP	Sampling and Analysis Plan
SCFA	Subsurface Contaminant Focus Area
SEP	Solar Evaporation Pond
SID	South Interceptor Ditch
SITE	Superfund Innovative Technology Evaluation
SNM	Special Nuclear Material
STP	Sewage Treatment Plant
SVOC	semivolatile organic compound
SWD	Soil Water Database
SWMU	Solid Waste Management Unit
TCA	1,1,1-trichloroethane
TCE	trichloroethene
TCLP	Toxicity Characteristic Leaching Procedure
TDEM	time-domain electromagnetic
TEF	toxicity equivalent factor
TEQ	toxicity equivalent
TPH	total petroleum hydrocarbons
TSCA	Toxic Substances Control Act
UBC	Under Building Contamination
USFWS	U S Fish and Wildlife Service
VOC	volatile organic compound
yd <sup>3</sup>	cubic yards

# **SECTION 1.0**

## **INTRODUCTION**

## 1.0 INTRODUCTION

### Background

The Rocky Flats Environmental Technology Site (RFETS) (the Site) began operation in 1951. Since 1951, materials defined as hazardous substances, pollutants, and contaminants by the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), and materials defined as hazardous waste and hazardous constituents by the Resource Conservation and Recovery Act (RCRA) and/or the Colorado Hazardous Waste Act (CHWA), have been produced, purchased, stored, consumed, disposed, and released at various locations at RFETS. Contaminants remain within some facility tank and pipe systems and filter plenums. Certain contaminants have been detected and remain in groundwater, sediments, surface water, and soil at the Site and thus pose potential human health and environmental risks.

RCRA regulations require that all Solid Waste Management Units (SWMUs) be identified. This became applicable to RFETS with the signing of a Compliance Agreement on July 31, 1986. At that time, the exact definition of a SWMU had not been formalized, therefore, guidance from the State of Colorado and the regional office of the U S Environmental Protection Agency (EPA) was used. The State of Colorado and EPA required the identification of all areas where environmental releases may have occurred, including hazardous waste and nonhazardous waste-related releases. Also included were single-release areas and long-term waste management areas where waste storage may (or is known to) have occurred.

SWMUs were initially identified in 1985 by the U S Department of Energy (DOE) Los Alamos Operations Office and are presented in the Draft Comprehensive Environmental Assessment and Response Program (CEARP) Phase I Installation Assessment. The study consisted of a records search, open literature survey, and interviews with RFETS employees. The SWMU terminology is a RCRA designation consisting of inactive waste disposal sites, accidentally contaminated sites, and sites found to pose environmental concern due to past or current waste management practices. Inspections were conducted at each site. The first identification of RFETS SWMUs, consistent with the guidance provided by the State of Colorado and the regional EPA, was presented as an appendix to the November 1986 RCRA Part B Permit Application.

Formal efforts to document the extent of Site contamination were established with the signing of the Interagency Agreement (IAG) in 1991. At that time, SWMUs at RFETS were renamed Individual Hazardous Substance Sites (IHSSs). IHSS is a term defined under CERCLA and the IAG as "locations associated with a release or threat of release of hazardous substances that may cause harm to human health/or the environment." The term IHSS is used today at RFETS. The IAG grouped IHSSs by similar contaminant or geographic location into 16 larger Operable Units (OUs), and schedules were set for further characterization. In accordance with the IAG, a Historical Release Report (HRR) was developed. The original intent of the HRR was to capture existing information on historical incidents and plant practices involving hazardous substances at RFETS. Additionally,

the IAG prescribed that the HRR reporting process continue quarterly for reporting of new or newly identified releases of hazardous substances to the environment (now identified as Potential Areas of Concern [PACs])

In 1996, the Rocky Flats Cleanup Agreement (RFCA) superseded the IAG RFCA incorporated the earlier IAG requirements for updating the HRR, however, it was agreed that reporting would be required annually instead of quarterly The first Annual Update was submitted in September 1996

The 16 OUs designated in the IAG were consolidated into 10 OUs during the RFCA negotiation process to reduce field and administrative requirements The consolidation of former OUs is presented in Table 1.1

**Table 1.1 RFCA Consolidation of Former OUs**

IAG Operable Unit Designation	RFCA Operable Unit Designation
Operable Unit 1 <sup>1</sup>	Closed under CAD/ROD <sup>1</sup>
Operable Unit 2	Incorporated into Buffer Zone Operable Unit
Operable Unit 3	Closed under CAD/ROD
Operable Unit 4	Incorporated into Industrial Area Operable Unit
Operable Unit 5	Unchanged Under RFCA
Operable Unit 6	Unchanged Under RFCA
Operable Unit 7	Unchanged Under RFCA
Operable Unit 8	Incorporated into Industrial Area Operable Unit
Operable Unit 9	Incorporated into Industrial Area Operable Unit
Operable Unit 10 <sup>2</sup>	Incorporated into Industrial Area Operable Unit <sup>2</sup>
Operable Unit 11	Closed Under CAD/ROD
Operable Unit 12	Incorporated into Industrial Area Operable Unit
Operable Unit 13	Incorporated into Industrial Area Operable Unit
Operable Unit 14	Incorporated into Industrial Area Operable Unit
Operable Unit 15 <sup>3</sup>	Closed Under CAD/ROD <sup>3</sup>
Operable Unit 16	Closed Under CAD/ROD

Areas shaded indicate accepted closure of an OU (i.e., CAD/ROD)

<sup>1</sup>Extraction and treatment of groundwater from the IHSS 119.1 Collection well was discontinued in February 2002 under agreements documented in the Final Major Modification to the OU 1 CAD/ROD (see Appendix 2)

<sup>2</sup>IHSSs 170, 174A, 174B, and 177 within former Operable Unit 10 are in the Buffer Zone Operable Unit

<sup>3</sup>Several IHSSs within former Operable Unit 15 were deferred until D&D is initiated or complete (refer to OU 15 CAD/ROD or Appendix 1)

At that time, Corrective Action Decisions/Record of Decisions (CADs/RODs) for OUs 11, 15, and 16 were already complete and CADs/RODs for OUs 1, 3, 5, 6, and 7 were in process or expected For this reason these OUs retained their IAG designations The Buffer Zone (BZ) OU incorporates all IHSSs from OU 2, IHSSs 170, 174A, and 174B from the former OU 10, and all PACs within

those IHSSs and the BZ The Industrial Area (IA) OU incorporates all IHSSs from OUs 4, 8, 9, 12, 13, and 14, IHSSs 115 and 196 from OU 6, all IHSSs from OU 10 with the exception of 170, 174A, and 174B, and all PACs and Under Building Contamination (UBC) Sites located within the IA

A large portion of the text contained within this Annual Update pertains to new information gathered to update previous IHSS, PAC, or UBC Site descriptions Many of the PAC narrative updates reflect regulatory agency comments to earlier annual updates In addition, starting October 24, 2001, through April 3, 2002, eight No Further Action (NFA) status meetings were conducted with DOE, Kaiser-Hill Company, L L C (K-H), EPA, and the Colorado Department of Public Health and Environment (CDPHE) to discuss outstanding HRR issues The meetings resulted in agreement of 91 NFA decisions relating to past HRR Quarterly and Annual Reports Subsequent to the outcome of these meetings, it was agreed that the 61 Potential Incidents of Concern (PICs) be discussed as addressed in the original HRR (DOE 1992) A PIC is defined as a documented event or occurrence resulting in a potential release to the environment, but with insufficient information to establish a location All 61 PICs were addressed in the NFA status meetings NFA status regarding 48 PICs was agreed to, while 13 PICs require further discussion and/or evaluation (see Appendix 1)

This document has been prepared in accordance with Part 9, Subpart B, paragraph 119 (l) of RFCA (DOE 1996), Notification of Spills, Releases, or Findings, and is presented in the format described below For this reporting period, August 1, 2001, through August 1, 2002, there were no additional HRR reportable spills, releases, or findings of contaminants identified at RFETS

For purposes of the HRR process and mapping clarity, original IHSS locations were designated a unique "PAC area" prefix number based upon geographic location For example, IHSS 123 1 is designated as PAC 700-123 1 An area where there has been a recent release or finding of a hazardous substance in the environment (post-1992) is also assigned a PAC area prefix number, followed by the next numerically highest PAC reference number for that area These areas are referred to as PACs and are equivalent to IHSSs in that they are CERCLA sites requiring disposition through the HRR and CERCLA reporting process PAC prefixes are selected according to 14 geographic subdivisions, as illustrated on Figure 1 1 Large PAC areas (i e , PACs that cross geographic PAC boundaries), such as the Original Process Waste Lines (OPWL), (PAC #000-121) and the Central Avenue Ditch (PAC #000-172), have been assigned a 000 prefix due to their boundary extent To date, there are 12 IHSSs and/or PACs with the 000 prefix

In addition to the 14 geographic areas, potential UBC Sites were also discussed in the original HRR (DOE 1992) UBC areas were necessary because of the potential contamination of soil under specific buildings from broken process waste lines or other potential sources related to the building histories Appendix 4, Plate #4, Potential Areas of Concern, shows the UBC locations identified at RFETS

PAC narratives include DOE Rocky Flats Field Office (RFFO) recommendations for NFA or No Further Remedial Action (NFRA) These recommendations are based on process knowledge,



analytical data from characterization and/or verification sampling, conservative risk-based screens,  
or formally conducted personal interviews

RFCA defines the NFA remedy selection as the determination that remedial actions are not currently warranted, however, such decisions are subject to revisitation at the time of the Final CAD/ROD. The Agency Acceptance Form included in past Quarterly and Annual Updates to the HRR was discontinued in the Fiscal Year (FY) 2000 Annual Update. As such, the current IHSS, PAC, and UBC Site regulatory status will be determined as part of an ongoing process between RFETS personnel and regulatory agencies. This Annual Update is divided into three sections and four appendices. They are described as follows:

**Section 1.0** is a historical summary of the HRR process and identifies the contents of this document. Section 1.0 includes three tables, as follows:

**Table 1.1**, located in the introductory background section, provides an overview of the OUs that resulted from regulatory agreements (that is, the IAG and RFCA).

**Table 1.2** is provided as a summary of the IHSS, PAC and UBC Site status contained within this Annual Update to the HRR.

**Table 1.3** is an up-to-date account of (1) the number of geographic areas (i.e., IHSSs, PACs, and UBC Sites) accepted as proposed NFA, either by written concurrence from the regulatory agencies or through the CAD/ROD process, (2) the number of geographic areas "proposed" for NFA since the 1992 HRR, for which concurrence has not been received from the regulatory agencies, and (3) the number of total geographic areas warranting further research, investigation, or action.

**Section 2.0** provides revised PAC/UBC Site narratives and incorporates new information regarding previously designated HRR sites. The revised narratives include the following types of information:

- Additional information or findings related to previously designated CERCLA sites, such as new data, boundary changes, corrections identified, etc.,
- Proposed NFA/NFRA status based upon process knowledge, analytical data, conservative risk-based screening, source removal (or approved treatment) of contaminants in accordance with agency-approved decision documents, such as the IA Sampling and Analysis Plan (SAP), BZSAP, subsequent SAP addenda, Proposed Action Memorandums (PAMs), Interim Measure/Interim Remedial Actions (IM/IRAs), or other authorizing decision documents,
- Additional information requested by the regulatory agencies during the comment and response period to meet the proposed NFA criteria,
- Approved NFA status based upon final CAD/ROD or other authorizing documentation, such as letters from the regulatory agencies, and
- Accelerated actions taken within the Environmental Restoration (ER) framework of field activities.

**Table 1.2 HRR PAC UBC Narrative Updates Contained in This Annual Report**

IHSS	OU	PAC	Site Description/Status	Updated	Proposed NFA
110	BZ	NE-110	Trench T-3	2001 Annual Update 2002 Annual Update	2001 <sup>1</sup> Annual Update
NA	BZ	NE-1407	OU 1 Treatment Facility	Eighth Quarterly Update	2002 Annual Update
170	BZ	NW-170	PU&D Yard	1999 Annual Update	2001 <sup>1</sup> Annual Update
133 2	BZ OU 5	SW-133 2	Ash Pit 2, <i>Ghost Location</i>	2001 Annual Update 2002 Annual Update	2001 <sup>1</sup> Annual Update
133 4	BZ OU 5	SW-133 4	Ash Pit 4, <i>Ghost Location</i>	2001 Annual Update 2002 Annual Update	2001 <sup>1</sup> Annual Update
121	IA	000-121	Process Waste Tank #40	1992 HRR	2002 Annual Update
148	IA	100-148	Building 123 Waste Leaks	1998 Annual Update	2002 Annual Update
NA	IA	100-603	Building 123 Bioassay Waste Spill	2001 Annual Update	2001 <sup>1</sup> Annual Update
NA	IA	100-609	Building 121 Security Incinerator	2002 Annual Update	2002 Annual Update
NA	IA	100-611	Building 123 Scrubber Solution Spill	2002 Annual Update	2002 Annual Update
NA	IA	500-906	Asphalt Surface Near Building 559	2002 Annual Update	2002 Annual Update
NA	IA	600-1005	Former Pesticide Storage Area	Seventh Quarterly Update	2002 Annual Update
NA	IA	700-1006	Process Waste Spill Portal 1	2002 Annual Update	2002 Annual Update
NA	IA	700-1114a and 1114b	Release During Liquid Transfer Operations from B774	Annual 1997	2001 <sup>1</sup> Annual Update
183	BZ	900-183	Gas Detoxification Area	2000 Annual Update	2001 <sup>1</sup> Annual Update
109	BZ	900-109	Trench T-2 Ryan Pit	1997 Annual Update	2001 <sup>1</sup> Annual Update
NA	IA	UBC-123	Building 123 UBC	2002 Annual Update	2002 Annual Update
NA	IA	UBC-125	Building 125 UBC	2002 Annual Update	2002 Annual Update
NA	IA	UBC-889	Building 889 UBC	2002 Annual Update	2002 Annual Update

Refer to Appendix 1 for current status of all HRR sites

Refer to Appendix 2 for regulatory agency correspondence letters

<sup>1</sup> NFA or NFRA was conditionally approved by EPA and CDPHE provided additional clarification or other information be provided in this Annual Update to the HRR

**Table 1.3 HRR Site Tracking and Status Through September 2002<sup>1</sup>**

HRR Site Status	IHSSs, PACs, and UBCs	PICs
Proposed NFA Accepted (CAD/ROD Process or other approval)	150	48
Proposed NFA (Pending Agency Review)	29	
Potential Further Action Warranted	180	13
<b>Total</b>	<b>359</b>	<b>61</b>

<sup>1</sup> Tracking includes IHSS, PAC/PIC, and UBC Sites at RFETS

**Section 3.0** briefly describes events for several environmental projects that occurred at the Site during the reporting period that are considered significant and should be documented. Information regarding OU 1-IHSS 119 1, the Solar Evaporation Ponds (SEP) (IHSS 101), the Original Landfill (IHSS 115) and the status made toward final agreements for the BZ Contamination Review sites

which were issued by the CDPHE on August 23, 1999, are included New in this Annual Update is a comprehensive list (Table 3 5) of buildings and structures that have been demolished through the D&D process at the Site

**Appendix 1** provides a list of all sites identified in the original HRR, Quarterly Updates, and Annual Updates to date A cross-reference with IHSS/UBC Site number (if applicable), IHSS numbers for PACs occurring within an IHSS boundary, and OU designation is provided in accordance with RFCA Additionally, Appendix 1 provides a reference to Quarterly or Annual Reports updating the information provided in the original PAC identification Recommendation for a PAC as a Proposed NFA or Approved for NFA is also provided, along with a reference to the Quarterly or Annual Report the designation was assigned HRR sites, which have been approved for NFA as proposed are presented with the approval date and applicable footnote

**Appendix 2** provides specific HRR correspondence letters from the regulatory agencies The letters pertain to reviews of HRR Quarterly Update and Annual Update Reports Resolution of issues and disposition of the subject PACs, IHSSs, and UBC Sites will be addressed through ongoing discussions and correspondence with the regulatory agencies In brief, the letters conditionally document acceptance of proposed NFA status, request additional information or data for some PACs or IHSSs that were proposed NFA, or specify nonconcurrency with the PAC/IHSS or UBC Site proposed for NFA in the HRR reporting process

**Appendix 3** provides notification and documentation for replacement/movement of soil that has undergone a hazardous and radiological constituent analysis (i e , comparison to RFCA Action Levels [ALs] for soils greater than RFCA Tier II ALs) This reporting is consistent with the approval agreement for the RFCA Standard Operating Protocol (RSOP) for Asphalt and Soil Management The reporting and documentation include a summary of the movement activity, volumes, origination, receiving sites, and contamination type(s) This appendix is identified as a "place-keeper" to describe and map such locations There were no soil samples exceeding the RFCA Tier II ALs relocated to other areas of "Put Back" during this reporting period Figure A-3 1 shows where such relocation/put-back decisions occurred historically

**Appendix 4** contains four plates and presents the most current and accurate IHSS, PAC, and UBC Site boundaries and status The RFCA Consolidated Operable Unit Map presented in RFCA and the original HRR PAC Area format are combined and illustrated as Plate #1 Plate #1 only illustrates IHSSs for which further investigation or action is warranted (as proposed in the HRR reporting process) Final NFA/NFRA and proposed NFA/NFRA IHSSs, PACs and UBC Sites are illustrated on a separate coverage (Plate #2), thereby easily delineating between the HRR sites that require further action and progress made toward Site remediation In addition, due to the complex nature of the original and new process waste transfer systems (IHSS 121 and PAC 000-504, respectively) and associated IHSSs resulting from these lines, an additional map (Plate #3) illustrates these areas on a separate coverage All areas shown on Plate #3 require further investigation at the present time Plate #3 was revised in FY2000 to show areas of known or suspected leaks within the waste transfer system piping, and specific line section numbers This plate also identifies the type of material used

for piping, results of pressure tests, and whether the pipe has been abandoned or is in current use. Several upgrades were made relevant to the process waste line coverage during this reporting period. The PAC and UBC map (Plate #4) is consistent with past HRR Update Reports and shows PAC and UBC Sites that require further investigation.

### Summary

This report is intended to provide a comprehensive compilation of historical information updated to reflect present conditions and response actions at RFETS with regard to environmental releases or significant events. It is not the intention of this Annual Update or past updates to change or amend researched information in the original HRR, but rather to provide additional facts for specific areas as they become available. Prior to initiating work within any designated area, all available documents should be reviewed, including, but not limited to, Environmental Technical Memorandums, Data Summary Reports, project specific-decision documents, and Accelerated Action Completion Reports.

## **SECTION 2.0**

# **REVISED PAC NARRATIVES**

**PAC REFERENCE NUMBER: NE-110**

IHSS Reference Number 110, Buffer Zone Operable Unit

Unit Name Trench T-3

Approximate Location N750,000, E2,087,000

Date(s) of Operation or Occurrence

1964 - 1968

Description of Operation or Occurrence

(Original HRR [DOE 1992])

Trench T-3 was used primarily for the disposal of sanitary wastewater and sewage treatment plant sludge. The sludge removed from the wastewater treatment plant was placed on sludge drying beds. Dried material removed from the sludge drying beds was placed into Trench T-3 (one of the East Disposal Trenches, also referred to as the East Trenches) until August 1968. The sanitary sludge disposal trenches are reported to be approximately 10 feet deep with 2 feet of soil cover (DOE 1992). In addition, miscellaneous waste including crushed drums, asphalt planking, and construction debris was also disposed of in Trench T-3 (DOE 1996a).

Physical/Chemical Description of Constituents Released

Some uranium and plutonium contamination was present in sludge during this time frame. It is reported that the older sludge had primarily uranium contamination with newer sludge having an increasing amount of plutonium contamination. Total long-lived alpha activity present in the sludge in the East Trenches (not specifically Trench T-3) was reported to be between a maximum of 3,591 picocuries per gram (pCi/g) in June 1960 and a minimum of 382 pCi/g in August 1964. Uranium contamination was present in flattened drums that were disposed in this trench (DOE 1992). Flattened drums, estimated to be more than 300 in total number, are known to have been buried in Trench T-3 (DOE 1996a).

Approximately 2,400 gallons of water and lathe coolant generated in Building 444 was reportedly disposed of in one of the East Trenches (not specifically Trench T-3). This waste had an average activity of 150,000 disintegrations per minute per liter (dpm/l) (believed to be total alpha activity). The activity of this material was reported as  $1.35 \times 10^8$  disintegrations per minute (dpm) with

approximately 1.3 kilograms (kg) of depleted uranium present in the waste. It is unknown whether or not this material was in drums (DOE 1992)

#### Responses to Operation or Occurrence

A source removal action was conducted in summer 1996 to excavate and treat contaminated material using low-temperature thermal desorption. This action was authorized by a Proposed Action Memorandum (PAM) for the Source Removal at Trenches T-3 and T-4 (IHSSs 110 and 111.1, respectively), Revision 2, dated March 28, 1996 (DOE 1996b). Approximately 1,706 cubic yards of volatile organic compound (VOC)-contaminated material was removed from Trench T-3 (PAC NE-110) and treated.

Excavation was completed July 3, 1996, and treatment of Trench T-3 material was completed by July 11, 1996. The completion report for the project details the treatment process, contaminants removed, condition of the trench following the removal action, and analytical results (DOE 1996c).

Approximately 200 cubic yards of debris (primarily crushed drums) were removed from the trench, treated if contaminated with VOCs, and packaged for offsite disposal. During packaging, 1 to 2 pounds of a black material was released from a drum and spread over a small work area. The material was found to be radioactive and may have been depleted uranium. Two roll-off containers and two waste-crates were used to contain the soil contaminated with this material (DOE 1996c). The containers were shipped to an approved offsite disposal facility.

#### Fate of Constituents Released to Environment

Soil treated as part of the source removal action was returned to the trench upon review of the post-treatment analytical data to confirm cleanup ALs were met. Debris excavated from the trench was characterized, treated, size-reduced, and containerized. Containerized debris was shipped to the Nevada Test Site (NTS) in September 1997. The source removal action for Trench T-3 removed contamination sources in accordance with cleanup values stipulated in the PAM. Review of the analytical data from this removal action indicate that disposal of the 2,400 gallons of water and lathe coolant from Building 444 did not occur in Trench T-3. Analytical data for this project are documented in the Completion Report for the Source Removal at Trenches T-3 and T-4, IHSSs 110 and 111.1 (DOE 1996c).

In 1999, the East Trenches groundwater remediation project was completed which collected and treated a plume of contaminated groundwater from the East Trenches area. That project is described in the Final East Trenches Plume Project Closeout Report (DOE 2000).



### Action/No Further Action Recommendation

The post-treatment levels of VOCs in the treated soil returned to Trench T-3 (PAC NE-110) were below the thermal desorption unit performance standards specified in the PAM (DOE 1996b), as documented in the completion report (DOE 1996c). Additionally, the excavation verification sample results for the contaminants of concern from Trench T-3 were below the cleanup values stipulated in the PAM (DOE 1996c).

These cleanup values were consistent with the RFCA Tier I subsurface soil action levels (DOE 1996d). Detectable VOCs in the excavation verification samples for Trench T-3 included carbon tetrachloride in one sample at a concentration of 1.8 parts per million (ppm) and tetrachloroethene in three samples with concentrations ranging from 0.74 ppm to 6.3 ppm. Approved cleanup levels for carbon tetrachloride and tetrachloroethene were 11 ppm and 11.5 ppm respectively (DOE 1996c).

Trench T-3 (PAC NE-110) was proposed for No Further Action (NFA) in the 1997 and 2000 Annual Updates to the HRR because the source removal and treatment goals specified in the PAM (DOE 1996b) were achieved and were consistent with the ALs agreed upon in RFCA (DOE 1996d). In accordance with the PAM (DOE 1996b), the source removal is considered complete because the verification sample concentrations were below cleanup levels and/or completed upon reaching groundwater or bedrock.

The regulatory agencies agreed to NFA as proposed for PAC NE-110 (Trench T-3) on October 2, 2001. The NFA agreement, however, was conditional based upon clarification regarding why an original HRR (DOE 1992) reference pertaining to 2,400 gallons of lathe coolant was deleted from the PAC NE-110 Narrative Update in the Annual Update for FY2000. As agreed, an explanation is provided in the Comments section below.

### Comments

Trenches T-3 through T-11 are referred to as the East Trenches (DOE 1992).

Trench T-3 (PAC NE-110) had few operational differences from Trenches T-4 through T-11.

No documentation was found regarding the exact dates of operation of individual trenches. Interviewees were unaware of operating dates and could provide no additional information (DOE 1992).

The PAC Narrative Update for PAC NE-110 submitted in the 1997 Annual Update to the HRR states that no evidence could be found either from physical excavation or analytical data review to support the 1992 HRR reference pertaining to 2,400 gallons of lathe coolant being disposed of in one of the East Trenches. Recent additional review of referenced material supporting the 1992 HRR could not provide further disposition with regard to where the lathe coolant was disposed. The 2000 Annual Update removed text regarding the lathe coolant because the PAC Narrative was site-specific.

to current information regarding Trench T-3 The 1992 HRR for the East Trenches is generally comprehensive, grouping all the information for all the trenches and is not site-specific It is also possible that the liquid potentially disposed of in one of the East Trenches was diluted sufficiently so that no residual effect has been identified to date, or that the coolant never reached the East Trenches

### References

DOE, 1992, Historical Release Report for the Rocky Flats Plant, Rocky Flats Plant, Golden, CO, June

DOE, 1996a, Annual Update for the Historical Release Report, August 1, 1995, through August 1, 1996, RF/ER-96-0046, Rocky Flats Environmental Technology Site, Golden, CO, September

DOE, 1996b, Proposed Action Memorandum for the Source Removal at Trenches T-3 and T-4 IHSSs 110 and 111 1, Revision 2, RF/ER-95-111 UN, Rocky Flats Environmental Technology Site, Golden, CO, March

DOE, 1996c, Completion Report for the Source Removal at Trenches T-3 and T-4 IHSSs 110 and 111 1, RF/ER-96-0051, Revision 2, Rocky Flats Environmental Technology Site, Golden, CO, September

DOE, 1996d, Final Rocky Flats Cleanup Agreement, Department of Energy, Rocky Flats Environmental Technology Site, Golden, CO, July

DOE, 2000, Final East Trenches Plume Project Closeout Report, Fiscal Year 1999, RF/RMRS-99-443 UN, Rocky Flats Environmental Technology Site, Golden, CO, February

K-H, 2000, Historical Release Report (Interim Update) and Response to Comments for HRR Annual Updates (1997, 1998 & 1999), Rocky Flats Environmental Technology Site, Golden, CO, August

**PAC REFERENCE NUMBER: NE-1407**

IHSS Number Not Applicable

Unit Name OU 2 Treatment Facility

Location N749,900, E2,087,000

Date(s) of Operation or Occurrence

March 9, 1993

Description of Operation or Occurrence

The OU 2 Treatment Facility was located in the 900 Area on the hillside north of Woman Creek and was in operation from May 1991 until August 1995. The facility was used primarily to treat contaminated groundwater using a chemical precipitation/microfiltration/granular activated carbon system. On March 9, 1993, at 3 10 p m, approximately 50 gallons of untreated seepage/spring water leaked from a ruptured elbow in a secondary containment line near the facility.

Physical/Chemical Description of Constituents Released

Routine sampling of the influent water indicated concentrations of carbon tetrachloride, trichloroethane, tetrachloroethene, chromium, and 1,2-dichloroethene were slightly above the Safe Drinking Act (SWDA) drinking water standards (DOE 1993).

Responses to Operation or Occurrence

In response to the leak, the pump was turned off, and a berm was constructed to contain the spill area within a radius of 150 square feet. Analytical data for the influent water suggested that the release did not pose an unacceptable risk to human health and the environment and therefore, immediate removal of the affected soil was not performed.

In accordance with Buffer Zone Sampling and Analysis Plan (BZSAP) Addendum #BZ-02-01 for the NE/NW Group (DOE 2002), characterization samples were collected on June 25, 2002 (Figure 2 1), from five locations. Analytical results for surface and subsurface soil indicate potential contaminant concentrations were less than Rocky Flats Cleanup Agreement (RFCA) Tier II Action Levels (ALs). Analytical results greater than method detection limits (MDLs) and/or background (mean plus two standard deviations) are shown on Table 2 1.

**Table 2.1 Analytical Data Below MDL and/or Background**

Analyte	Total Samples Collected	Total Samples Greater Than Bkgd or MDL	Detection Frequency (%)	Max Result	Avg Result	Tier I AL (mg/kg)	Tier II AL (mg/kg)	Bkgd	Units	Exceeds Tier II AL
Methylene chloride	5	1	20	0.94	0.94	578	578	NA	ug/kg	No
Tetrachloroethene	5	3	60	3.3	2.233333	3150	315	NA	ug/kg	No
Aluminum	5	1	20	17300	17300	1000000	1000000	16902	mg/kg	No
Arsenic	5	5	100	6.7	4.94	299	2.99	10.09	mg/kg	Yes
Calcium	5	4	80	16900	11950			4467	mg/kg	No
Chromium	5	3	60	31.1	25.83333	44300	4410	16.99	mg/kg	No
Copper	5	3	60	36.9	31.83333	71100	71100	18.06	mg/kg	No
Iron	5	3	60	21900	20266.67	576000	576000	18037	mg/kg	No
Lithium	5	4	80	13.4	12.475	38400	38400	11.55	mg/kg	No
Magnesium	5	4	80	12200	8260			2849.3	mg/kg	No
Manganese	5	2	40	436	414	83600	83600	365.08	mg/kg	No
Nickel	5	3	60	28.3	23.5	38400	38400	14.91	mg/kg	No
Potassium	5	1	20	2980	2980			2967.2	mg/kg	No
Sodium	5	5	100	1260	526.4			91.84	mg/kg	No
Strontium	5	3	60	84.2	64.46667	1000000	1000000	48.94	mg/kg	No
Vanadium	5	2	40	58.1	52.1	13400	13400	45.59	mg/kg	No

Table presents surface and subsurface sampling results greater than MDL and/or background

- Tier II values for nonradionuclides represent either 1E+06 carcinogenic risk or a hazard index of 1 for noncarcinogenic toxicity
- Tier II values for radionuclides are based on an annual dose limit of 15 mrem to a hypothetical future resident.
- Tier I values for nonradionuclides represent either 1E+04 carcinogenic risk or a hazard index of 1 for noncarcinogenic toxicity
- Tier I values for radionuclides are based on an annual dose limit of 85 mrem to a hypothetical future resident

### Fate of Constituents Released to Environment

Based upon the known concentrations of influent water that were slightly above the SDWA drinking water standards and the June 2002 characterization results, it is unlikely that this release contributes an actual or potential risk to human health or the environment

### Action/No Further Action Recommendation

Based upon the actions taken in 1993 and characterization results of the soil samples collected in accordance with BZSAP Addendum #BZ-02-01 for the NE/NW Group (DOE 2002), no potential contaminant source or remnant concentrations could be identified for PAC NE-1407. Therefore, in accordance with RFCA (DOE 1996), PAC NE-1407 is being proposed for No Further Action at this time.

### Comments

Arsenic concentrations exceeded RFCA Tier II ALs at all five locations but were well below the background concentrations of 10 09 milligrams per kilogram (mg/kg)

### References

DOE, 1996, Final Rocky Flats Cleanup Agreement, Department of Energy, Rocky Flats  
Environmental Technology Site, Golden, CO, July

DOE, 2002, Buffer Zone Sampling and Analysis Plan, Addendum # BZ-02-01, Rocky Flats  
Environmental Technology Site, April

**PAC REFERENCE NUMBER: PAC NW-170**

IHSS Reference Number 170, Buffer Zone Operable Unit

Unit Name PU&D Storage Yard

Approximate Location N751,500, E2,082,000

Date(s) of Operation or Occurrence

1974 – 1994

Description of Operation or Occurrence

Historically, the Property Utilization and Disposal (PU&D) storage yard was used for storing empty drums and dumpsters, cargo boxes, cable spools, and similar materials. The yard was divided in thirds with wire fences. The eastern third was used for storage of scrap metal and encompassed the drum (PAC-NW-174A) and dumpster (PAC-NW-174B) storage areas. The center third was used for the storage of equipment such as stainless steel tanks. The western third was used for the storage of excess property. The greatest potential for contamination was considered the eastern third because scrap metal may have been stored without prior decontamination and hazardous materials in drums and dumpsters were transferred in this area of the yard (DOE, 1992).

An incident involving a radioactively contaminated drum in the yard occurred in December 1987. An unknown powder spilled out of a drum while the drum, which had no bung and was believed to be empty, was being rolled over to a truck for offsite recycling (DOE, 1992). Approximately 95 percent of the spilled powder was recovered with the affected soil and analyzed as a soil sample. The drum was found to contain a small amount of radioactive powder. This powder was not detected by exterior radiation monitoring, however results of a sample of the pure powder indicated 3,000 picocuries per gram (pCi/g) plutonium, 1,000 pCi/g americium, and 100 pCi/g uranium-235. The powder was composed of 60 percent aluminum oxide and 32.5 percent chromium oxide (Rockwell, 1987, DOE, 1992). This incident probably occurred in IHSS 174A, PU&D Drum Storage Facility (PAC-NW-174A).

An incident occurred in October 1990 involving drums stored in the yard. Approximately 100 empty drums were stored in the yard with the bungs unsecured. Rainwater entered the drums, became contaminated with residual hazardous materials, however it was not radioactively contaminated (DOE 1992). This incident probably occurred in IHSS 174A, PU&D Drum Storage Facility (PAC-NW-174A).

Detonation of unstable reactive chemicals was conducted on three occasions at the PU&D Yard on December 28, 1996, November 1, 1997, and November 27, 1997. The types of chemicals regarded as unstable (benzoyl peroxide, 1-methyl 3-nitro 1-nitrosoguanidine, anhydrous ethyl ether, methyl ethyl ketone, ammonium perchlorate, kerosene, BZ alloy, red phosphorous) were permitted for disposal using detonation methods by the CDPHE and EPA. Air sampling and radiological surveys were conducted prior to and after each event, and there were no reported releases associated with the operations (DOE, 1997).

#### Physical/Chemical Description of Constituents Released

A powder composed primarily of aluminum and chromium oxides, contaminated with plutonium, americium, and uranium, was spilled. Other releases may have occurred from leaking batteries, drums, and scrap metal stored without prior decontamination. Hazardous materials in drums and dumpsters were transferred in this area of the yard and may have resulted in release(s) (DOE, 1992).

#### Responses to Operation or Occurrence

An internal investigation report was generated after the unknown powder incident. PU&D, Waste Operations, and Waste Guidance groups were involved with the cleanup operations resulting from the rainwater in the drums. The rainwater in the drums was disposed in accordance with Site waste procedures. The drum bungs were tightened to prevent potential re-occurrence, and drum decontamination procedures were implemented (DOE, 1992).

Assessment of environmental contamination attributable to PU&D yard operations was initiated as part of the OU 10 Phase I RFI/RI (EG&G, 1995), and a pre-remedial investigation was conducted to assess VOCs in the subsurface soil (RMRS, 1997). Other sampling events and investigations are described in the following section.

#### Fate of Constituents Released to Environment

In 1993, 37 surface soil samples taken from IHSS 170 were analyzed for total metals, SVOCs, pesticides, and polychlorinated biphenyls (PCBs). No results were above RFCA Tier II surface soil Action Levels (ALs) (DOE, et al 1996). Forty-six locations within and adjacent to IHSS 170, 174a and 174b, also were surveyed with a High Purity Germanium (HPG) detector, and no anomalous radionuclide activities were observed. IHSS 170 overlaps IHSS 174a and IHSS 174b (see Appendix 4, Plates 1 and 2). A summary of surface soil detections for IHSS 170 is given in Table 2.2.

In 1994, approximately 235 soil gas locations were sampled within and adjacent to IHSS 170, 174a and 174b, for VOC analysis. The data is presented in the Draft Technical Memorandum 1, OU 10, Other Outside Closures (EG&G 1995), and shows that VOCs were potentially present in subsurface soils along the eastern third of the PU&D yard. Based upon these results, a pre-remedial investigation of IHSSs 170, 174a and 174b, was performed in August 1997 (RMRS, 1997a).

Characterization of the PU&D Yard was conducted to investigate the potential presence of a VOC contaminant source. The investigation consisted of 20 soil borings and 38 subsurface soil samples over IHSSs 170, 174A and 174B, which were analyzed for VOCs. In most cases, the borehole locations corresponded with areas where VOC detections in soil gas samples were observed in the 1994 survey.

**Table 2.2 Summary of Surface Soil Analyses in IHSS 170 (EG&G, 1995) and Comparison of Detects to RFCA Tier II Open Space Levels**

Contaminants of Concern	Location	Number of Surface Soil Samples	Number of Detects Above RFCA Tier II Open Space ALs
Total metals	IHSS 170	37	0
SVOCs	IHSS 170	37	0
Pesticides	IHSS 170	37	0
PCBs	IHSS 170	37	0
Radionuclides (by HPGe)	IHSS 170, 174A, and 174B	46	0

As a result, borehole locations within IHSS 170 were concentrated in the eastern third of the IHSS. Additionally, two boreholes were placed in areas of visibly stained soil. Table 2.3 summarizes the analytical results for soil borings associated with IHSS 170 (RMRS, 1997b). No VOC contaminants of concern (tetrachloroethene, trichloroethene, and 1,1,1-tetrachloroethane) were detected in subsurface soil samples from IHSS 170 (RMRS, 1997b). As indicated in Table 2.3, methylene chloride (a common laboratory contaminant) was detected in several of the subsurface soil samples, however, the contaminant was also detected in the method blank associated with the analyses. As a result, the identification of methylene chloride in the samples is likely attributable to laboratory contamination. Naphthalene was estimated in one sample from borehole 17897 at 390 µg/Kg, substantially below the RFCA Tier II subsurface soil ALs of 101,000 ug/kg.

Each soil boring had a pre-work 17-point survey performed with a Field Instrument for the Detection of Low-Energy Radiation (FIDLER). Based on the survey results, the three highest FIDLER measurements were selected for surface soil samples and analyzed for isotopic radionuclides. The isotopic results were below background levels.

Six groundwater samples were collected during the pre-remedial investigation of IHSSs 170, 174A and 174B. Three of the six samples were within the IHSS 170 boundary. Table 2.4 summarizes the analytical results for these three samples. The tetrachloroethene (PCE) concentration of 15 µg/L detected in groundwater, from borehole 18197, is above the RFCA Tier II groundwater AL of 5 µg/L. Trichlorotrifluoroethane was also detected in groundwater from IHSS 170 that also may indicate impact from past practices (i.e., freon-based lathe coolant). However, a RFCA AL for the compound has not been calculated. The 1,1,1-trichloroethane (TCA) of 6.3 µg/L was below the RFCA Tier II groundwater AL of 200 µg/L.



Table 2.3 VOC Analytical Results for IHSS 170 Subsurface Soil (RMRS, 1997b)

Borehole No.	Sample Depth (ft)	Methylene Chloride (µg/L)	Comparison Value for Methylene Chloride (µg/L)		Naphthalene (µg/L)	Action Level for Naphthalene (µg/L)	
			RFCA Tier I	RFCA Tier II		RFCA Tier I	RFCA Tier II
17797	4 4-4 9	2,100B	578	578	<630 (ND)	10,100,000	101,000
17897	5 4-5 9	<630 (ND)	578	578	390J	10,100,000	101,000
18097	5 0-5 5	440JB	578	578	<630 (ND)	10,100,000	101,000
18197	5 0-5 5	2,600B	578	578	<630 (ND)	10,100,000	101,000
18297	5 0-5 5	400JB	578	578	<630 (ND)	10,100,000	101,000
18397(A)	5 0-5 5	400JB	578	578	<630 (ND)	10,100,000	101,000
18497(A)	5 0-5 5	410JB	578	578	<630 (ND)	10,100,000	101,000
18597(A)	5 0-5 5	370JB	578	578	<630 (ND)	10,100,000	101,000
18697(A)	5 0-5 5	400JB	578	578	<630 (ND)	10,100,000	101,000

A = Borehole location immediately adjacent (downgradient) to the IHSS

ND = Not detected

J = Estimated concentration of analyte detected below the method practical quantitation limit

B = Analyte detected in the method blank

• Tier II values for nonradionuclides represent either 1E+06 carcinogenic risk or a hazard index of 1 for noncarcinogenic toxicity

• Tier II values for radionuclides are based on an annual dose limit of 15 mrem to a hypothetical future resident

• Tier I values for nonradionuclides represent either 1E+04 carcinogenic risk or a hazard index of 1 for noncarcinogenic toxicity

• Tier I values for radionuclides are based on an annual dose limit of 85 mrem to a hypothetical future resident

Analytical data from the pre-remedial investigation were evaluated for data usability and assessed in terms of the five data quality parameters precision, accuracy, representativeness, completeness, and comparability (PARCC) parameters. The data are considered sufficient to meet the PARCC parameters and meet the projects data quality objectives to characterize subsurface VOC contamination in IHSS 170.

Based on the analytical results from the pre-remedial investigation, a VOC contaminant source was not identified. Additionally, concentrations of VOCs equal to or above RFCA Tier I subsurface soil AL were not identified in the area of IHSS 170 (see Table 2.2).

PCE detected in groundwater (see Table 2.4) indicates that the area was likely affected by previous drum storage and handling operations from IHSS 174a (PAC-NW-174a). However, PCE was not detected in the soil samples from boreholes placed in IHSS 170 indicating a residual source in excess of ALs does not remain.

#### Action/No Further Action Recommendation for IHSS 170

No surface or subsurface soil analyses demonstrated the presence of contaminants above RFCA Tier II surface soil ALs in IHSS 170. Additionally, based on surface and subsurface soil analytical data collected during the pre-remedial investigation, no existing or potential source of contamination associated with IHSS 170 could be identified. A potential source of VOC contamination likely exists within IHSS 174a and may have dispersed through the IHSS 170 subsurface. All data for this update have been reevaluated and compared with RFCA ALs using current screening methodologies. The recommendation for NFA of IHSS 170 was approved during the NFA Status meetings held in 2002.

Groundwater at IHSS 170 containing PCE concentrations above the RFCA Tier II groundwater AL is not considered in the Action/NFA recommendation because groundwater contamination at RFETS is addressed by the Integrated Water Management Plan (KH, 1996). A plume of VOC contamination, which encompasses IHSS 170, has been delineated. The plume is monitored by the RFCA groundwater monitoring program at the perimeter. Monitoring indicates that there are no known or potential surface water impacts. Details on the groundwater monitoring program are reported in the Annual RFCA Groundwater Monitoring Report(s) (RMRS, 1998).

**Table 2.4 VOC Analytical Results for IHSS 170 Groundwater (RMRS 1997)**

Borehole No	Sample Depth (ft)	PCE (µg/L)	Comparison Value for PCE (µg/L)		1,1,1-TCA (µg/L)	Action Level for 1,1,1-TCA (µg/L)		Trichlorotrifluoroethane (µg/L)*  *No existing RFCA action level
			RFCA Tier I	RFCA Tier II		RFCA Tier I	RFCA Tier II	
17897	7 33	<5 (ND)	500	5	<5 (ND)	20,000	200	3 5J
18097	7 2	<5 (ND)	500	5	<5 (ND)	20,000	200	<5 (ND)
18197	8 9	15	500	5	6 3	20,000	200	<5 (ND)

A = Borehole location immediately adjacent (downgradient) to the IHSS

ND = Not detected

J = Estimated concentration of analyte detected below the method practical quantitation limit

B = Analyte detected in the method blank

- Tier II values for nonradionuclides represent either 1E+06 carcinogenic risk or a hazard index of 1 for noncarcinogenic toxicity
- Tier II values for radionuclides are based on an annual dose limit of 15 mrem to a hypothetical future resident
- Tier I values for nonradionuclides represent either 1E+04 carcinogenic risk or a hazard index of 1 for noncarcinogenic toxicity
- Tier I values for radionuclides are based on an annual dose limit of 85 mrem to a hypothetical future resident

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### Comments

IHSS 170 overlaps with PAC-NW-174a (IHSS 174a), PAC-NW-174b (IHSS 174b), PAC-NW-1500, and PAC-NW-1501

### References

DOE, 1992, *Historical Release Report for the Rocky Flats Plant*, Rocky Flats Plant, Golden, CO, June

DOE, EPA, CDPHE, K-H, 1996, *Final Rocky Flats Cleanup Agreement*, Department of Energy, Rocky Flats Environmental Technology Site, Golden, CO, July

DOE, 1997, *Annual Update for the Historical Release Report*, Revision 0, RF/RMRS-97-073 UN, Rocky Flats Environmental Technology Site, Golden, CO, September

EG&G 1995, *Draft Technical Memorandum 1, OU 10, Other Outside Closures*, Rocky Flats Environmental Technology Site, Golden, CO, January

KH, 1996, *Integrated Water Management Plan for the Rocky Flats Environmental Technology Site (Final)*, RF/ER-96-0037, Rocky Flats Environmental Technology Site, Golden, CO, August

RMRS, 1997a, *Final Sampling and Analysis Plan for the Pre-Remedial Investigation of IHSSs 170, 174A and 174B, Property Utilization & Storage Yard*, RF/RMRS-97-036, Rev 0, Rocky Flats Environmental Technology Site, Golden, CO, August

RMRS, 1997b, *Data Summary Report for IHSSs 170, 174A, and 174B, Property Utilization and Storage Yard*, RF/RMRS-97-080 UN, Rocky Flats Environmental Technology Site, Golden, CO, September

RMRS, 1998, *Draft 1997 Annual RFCA Groundwater Monitoring Report*, RF/RMRS-98-273 UN, Rocky Flats Environmental Technology Site, Golden, CO, September

Rockwell, 1987, Internal Letter to File from F J Blaha, Subject Empty Drum Recycling Incident of 12/4/87, December

## PAC REFERENCE NUMBERS: SW-133.2 AND 133.4 (GHOST LOCATIONS)

IHSS Reference Numbers SW-133 2 and 133 4

Unit Name Ash Pits #2 and #4 (OU 5) (*Ghost Locations Identified in 1995 for Further Investigation*)

Approximate Location N748,000, E2,080,000

### Date(s) of Operation or Occurrence

1950s - 1968

### Description of Operation or Occurrence

#### General History of the Ash Pits as Documented in the 1992 HRR (DOE 1992)

The 1992 HRR reported four ash burial sites identified as IHSSs SW-133 1, SW-133 2, SW-133 3, and SW-133 4 located south and east of the former incinerator area (IHSS 133 5). These trenches were used for disposal of ash (and noncombustible trash from various sources) from the incinerator that operated from approximately 1952 until 1968. Noncombustible trash, such as counting discs, broken glassware, and metal was collected in a nearby dumpster and disposed of in the trenches. In September 1954, five ash samples from the burning of Building 991 wastes were collected. The average activity of the ash was  $4.5 \times 10^7$  disintegrations per milligram per kilogram (dpm/kg) of dry ash. The alpha activity of the ash was approximately 100 times higher than the usual ash samples from the incinerator. In 1956, special monitoring was performed during and after contaminated waste was burned in the Plant incinerator. Ash samples contained 1.9 grams of radioactive material (depleted uranium) per kilogram of ash. Smear surveys of the incinerator before and after burning showed no increase in contamination. It was estimated that approximately 30,000 cubic feet of soil and ash were buried in the trenches. Ash from the incinerator and "dump area" was radiologically monitored in 1959 (DOE 1992) and showed activities of 4,000 counts per minute (cpm) alpha and 30 millirems per hour (mr/hr) beta (DOE 1992). The ash was buried in one of the trenches. It is unclear whether the ash dump refers to the area immediately around the incinerator or the Original Landfill (IHSS SW-115). Special air sampling of the Plant incinerator was conducted in 1958 to address concerns of burning potentially contaminated waste from Buildings 444 and 447.

The ash pit trenches are approximately 150 to 200 feet long, 12 feet wide, and 10 feet deep, and have been staked with steel fence posts and mapped. Approximately 3 feet of soil covers each trench location. Two additional burial trenches (PACs SW-1701 and SW-1702) were identified in 1994 (DOE 1996a) based on anomalies found during a time-domain electromagnetic (TDEM) conductivity survey. The TDEM survey also identified additional anomalies adjacent to Ash Pits 2 and 4 (IHSSs 133 2 and IHSS 133 4 respectively). In each case, the southern most anomaly at each location was referred to as a twin investigation area as documented in the Operable Unit 5

Final Phase 1 RFI/RI Report (RMRS 1996) The areas are shown on Figure 2 2 and are referred to as "Ghost Ash Pits", i e SW-133 2 (Ghost) and SW-133 4 (Ghost)

#### Physical/Chemical Description of Constituents Released

Small quantities of depleted uranium-contaminated combustibles were burned along with the general combustible Plant refuse One estimate indicates that less than 100 grams of depleted uranium were in the combustibles A monthly ash sampling program was initiated in January 1962 and indicated there was 1 to 8 kilograms of depleted uranium per ton of ash (DOE 1992)

#### Responses to Operation or Occurrence

Sampling events were conducted from November 24, 1953, through December 9, 1954 In 1970, the locations of Ash Pits 1-1 through 1-4 were marked in the field The ash in these trenches was evaluated and considered to present no problems unless disturbed and inhaled

The ash pit sites and surrounding area were extensively sampled as part of the Final OU 5 RFI/RI (DOE 1996) and through groundwater and surface water monitoring The locations of boreholes, wells, surface soil samples, sediment samples, and surface water samples used in this evaluation are shown on Figure 2 2 On December 5, 2001, the regulatory agencies were in agreement that based upon the analytical data provided in the 2001 Annual Update to the HRR, PAC SW-1701 and PAC SW-133 3 were NFA Further, the agencies agreed that the SW-133 2 and SW-133 4 "Ghost" locations were NFA and analytical data specific to the Ghost pits should be submitted in this Annual Update Table 2 5 and Table 2 6 show surface and subsurface soil results from boreholes located within each Ghost Ash Pit All of the data from these locations are below RFCA Tier II ALs with exception of one beryllium detection and one arsenic detection which were slightly above background (i e , current Tier II ALs are below background)

#### Fate of Constituents Released to Environment

In accordance with RFCA (DOE, et al 1996b), the basis for an NFA determination is establishing that there is no actual or potential risk to human health or the environment Specifically, the "ghost" ash pit locations present no potential risk to human health or the environment based upon the data collected The 1996 TDEM survey presented in the Final RFI/RI Report along with borehole data show that no contaminant source could be identified Tables 2 6 and 2 7 summarize the results

**Table 2.5 Summary of Analytical Results for Surface and Subsurface Soils at IHSS 133.2  
(Ghost) Location**

Analyte	Maximum Concentration	Unit	Tier I Action Level	Tier II Action Level	Background Concentration
Aluminum	23200	mg/kg	1000000	1000000	35373 2
Americium-241	0	pCi/g	215	38	0 02
Arsenic	17	mg/kg	299	2 99	13 1
Barium	272	mg/kg	133000	133000	289 4
Beryllium	1	mg/kg	104	1 04	14 2
Cadmium	1	mg/kg	1920	1920	1 7
Calcium	9970	mg/kg	NA	NA	39382 27
Chromium	28	mg/kg	44300	4410	68 3
Cobalt	15	mg/kg	115000 0	115000	29 0
Copper	34	mg/kg	71100 0	71100	38 2
Gross Alpha	41	pCi/g	NA	NA	43 5
Gross Beta	49	pCi/g	NA	NA	36 8
Iron	25400	mg/kg	576000 0	576000	41046 5
Lead	27	mg/kg	1000 0	1000	25 0
Lithium	19	mg/kg	38400 0	38400	34 7
Magnesium	6900	mg/kg	NA	NA	9315 4
Manganese	1070	mg/kg	83600	83600	901 6
Nickel	31	mg/kg	38400 0	38400	62 2
Plutonium-239/240	0	pCi/g	1429 0	252	0 02
Potassium	2660	Mg/kg	NA	NA	6196 8
Selenium	0	Mg/kg	9610 0	9610	4 8
Silicon	237	Mg/kg	NA	NA	NA
Sodium	1590	Mg/kg	NA	NA	1251 2
Strontium	96	Mg/kg	1000000 0	1000000	211 4
Thallium	0	Mg/kg	NA	NA	1 8
Uranium-234	3	pCi/g	1738	307	2 6
Uranium-235	0	pCi/g	0 9	24	0 12
Uranium-238	2	pCi/g	586	103	1 5
Vanadium	51	Mg/kg	13400	13400	88 5
Zinc	74	Mg/kg	576000	576000	139 1

- Tier II values for nonradionuclides represent either 1E+06 carcinogenic risk or a hazard index of 1 for noncarcinogenic toxicity
- Tier II values for radionuclides are based on an annual dose limit of 15 mrem to a hypothetical future resident
- Tier I values for nonradionuclides represent either 1E+04 carcinogenic risk or a hazard index of 1 for noncarcinogenic toxicity
- Tier I values for radionuclides are based on an annual dose limit of 85 mrem to a hypothetical future resident

**Table 2.6 Summary of Analytical Results for Surface and Subsurface Soils at IHSS 133.4  
(Ghost) Location**

Analyte	Maximum Concentration	Unit	Tier I Action Level	Tier II Action Level	Background Concentration
Aluminum	32800	mg/kg	1000000	1000000	35373 2
Americium-241	0	pCi/g	215	38	0 02
Antimony	16	mg/kg	768	768	16 97
Arsenic	6	mg/kg	299	2 99	13 1
Barium	248	mg/kg	133000	133000	289 4
Beryllium	2	mg/kg	104	1 04	14 2
Cadmium	1	mg/kg	1920	1920	1 7
Calcium	31700	mg/kg	NA	NA	39382 27
Chromium	34	mg/kg	44300	4410	68 3
Cobalt	22	mg/kg	115000 0	115000	29 0
Copper	26	mg/kg	71100 0	71100	38 2
Gross Alpha	34	pCi/g	NA	NA	43 5
Gross Beta	37	pCi/g	NA	NA	36 8
Iron	29700	mg/kg	576000 0	576000	41046 5
Lead	25	mg/kg	1000 0	1000	25 0
Lithium	29	mg/kg	38400 0	38400	34 7
Magnesium	6000	mg/kg	NA	NA	9315 4
Manganese	473	mg/kg	83600	83600	901 6
Mercury	0	mg/kg	576	576	1 52
Nickel	30	mg/kg	38400 0	38400	62 2
Plutonium-239/240	0	pCi/g	1429 0	252	0 02
Potassium	7040	mg/kg	NA	NA	6196 8
Sodium	1370	mg/kg	NA	NA	1251 2
Strontium	72	mg/kg	1000000 0	1000000	211 4
Tin	5	mg/kg	1000000 0	1000000	286 31
Uranium-234	2	pCi/g	1738	307	2 6
Uranium-235	0	pCi/g	135	24	0 12
Uranium-238	3	pCi/g	586	103	1 5
Vanadium	94	mg/kg	13400	13400	88 5
Zinc	77	mg/kg	576000	576000	139 1

- Tier II values for nonradionuclides represent either 1E+06 carcinogenic risk or a hazard index of 1 for noncarcinogenic toxicity
- Tier II values for radionuclides are based on an annual dose limit of 15 mrem to a hypothetical future resident
- Tier I values for nonradionuclides represent either 1E+04 carcinogenic risk or a hazard index of 1 for noncarcinogenic toxicity
- Tier I values for radionuclides are based on an annual dose limit of 85 mrem to a hypothetical future resident



### Action/No Further Action Recommendation

The Final OU 5 RFI/RI Report summarized all data that had been collected and recommended that NFA was warranted at OU 5 based on the human health risk assessment. Data presented in this PAC Narrative Update is specific to the SW-133 2 and SW-133 4 "Ghost" locations and discussed during the NFA Status meeting on December 5, 2001. In the meeting, the regulatory agencies agreed that based upon the analytical data provided in the 2001 Annual Update to the HRR, PAC SW-1701 and PAC SW-133 3 were NFA as shown on Figure 2.2. Further, the agencies agreed that the SW-133 2 and SW-133 4 "Ghost" locations were NFA and therefore will be placed on Plate 2 (see Appendix 4).

### Comments

None

### References

DOE, 1992, *Historical Release Report for the Rocky Flats Plant*, Rocky Flats Plant, Golden, CO, June

DOE 1993, *Background Geochemical Characterization Report*, Golden, CO, September

DOE 1995, *Geochemical Characterization of Background Surface Soils Background Soils Characterization Program*, Golden, CO, May

DOE, 1996a, *Final Phase I RFI/RI Report, Woman Creek Drainage, Operable Unit 5, Vol 1*, Rocky Flats Environmental Technology Site, Golden, CO, April

DOE, 1996b, *Final Rocky Flats Cleanup Agreement*, Rocky Flats Environmental Technology Site, Golden, CO, July

DOE, 2000, *Final Rocky Flats Cleanup Agreement Attachment 5, Rocky Flats Environmental Technology Site Action Levels and Standards Framework for Surface Water, Ground Water, and Soils*, Rocky Flats Environmental Technology Site, Golden, CO, March

**PAC REFERENCE NUMBER: 000-121 (TANK 40)**

IHSS Number                      Not Applicable

Unit Name                        Original Process Waste Lines (OPWL), Tank 40

Location                         N749,000, E2,084,000

Date(s) of Operation or Occurrence

1952 to 1983 (approximate)

Description of Operation or Occurrence

Tank 40 is part of IHSS 000-121, the Original Process Waste Lines(OPWL) It consists of two 400-gallon underground concrete tanks underlying a concrete vault approximately 7 feet deep located in the 800 Area west of Building 889 Tank T-40 was reportedly installed in the mid-1950s and was abandoned in 1981 or 1982 The tank was emptied, rinsed, and foamed in 1996

Building 889 housed decontamination and waste reduction operations for wastes originating outside the Protected Area (PA) Wastes entering Building 889 included surplus equipment that would be decontaminated by steam cleaning for reuse onsite or sale offsite High-efficiency particulate air (HEPA) filters, combustible wastes, and nonreusable equipment were compacted, placed in crates, and shipped offsite for disposal

Physical/Chemical Description of Constituents Released

Potential contaminants of concern (PCOCs) include radionuclides, metals, volatile organic compounds (VOCs) and semi-volatile organic compounds (SVOCs) (refer to Industrial [IA] Sampling and Analysis Plan (SAP) Addendum #IA-02-01 [DOE 2001]) High-purity germanium (HPGe) surveys conducted during the Operable Unit (OU) 9 Resource Conservation and Recovery Act (RCRA) Facility Investigation/Remedial Investigation (RFI/RI) indicated that uranium-235 and uranium-238 activities were above background Additionally, one Field Instrument for the Detection of Low-Energy Radiation (FIDLER) measurement at a site on the southeastern side of the tank indicated activity above background U-233/234 exceeded background at a depth of 0 to 0.5 foot Groundwater samples collected from boreholes near the tank indicated that barium, calcium, magnesium, manganese, mercury, sodium, and strontium exceeded background These data are available in the IA Data Summary Report (DOE 2000)

Historical data indicate the presence of methylene chloride and tetrachloroethene (PCE) in subsurface soil and the presence of beryllium in surface soil Tables 2.7 and 2.8 summarize historical and new soil characterization data Table 2.7 shows that four subsurface samples had methylene chloride concentrations greater than the reporting limit and that the maximum concentration exceeded the Tier II action level (AL) Table 2.8 also shows that two subsurface

samples had PCE concentrations greater than the reporting limit and that the maximum concentration exceeded the Tier II AL. Table 2.8 shows that one surface sample had a beryllium concentration greater than the Tier II AL. No other contaminants exceeded Tier II ALs. Table 2.9 presents sample results for contaminants that exceeded Tier II ALs. All exceedances are associated with historical data, and the analytical results for methylene chloride and PCE are qualified as estimated values (i.e., J-qualified). Figure 2.3 shows the location of all samples (historical and new).

**Table 2.7 Tank 40 Subsurface Soil Summary Statistics for Historical and Newly Acquired Data**

Analyte	Total Samples Collected	Total Samples Greater Than Bkgrd or RL	Detection Frequency (%)	Maximum of Results	Average of Results	Tier I Action Level	Tier II Action Level	Background Level	Unit
2-Butanone	6	1	16.66667	6.6	6.6	NA	NA	NA	ug/kg
2-Methylnaphthalene	6	3	50	9200	3383.333	NA	NA	NA	ug/kg
Acetone	6	4	66.66667	91	37	27,200,000	272,000	NA	ug/kg
Benzo(a)anthracene	6	1	16.66667	50	50	160,000	1,600	NA	ug/kg
Bis(2-ethylhexyl)phthalate	6	1	16.66667	1900	1900	311,000,000	3,110,000	NA	ug/kg
Calcium	5	4	80	78900	60450	NA	NA	39382.27	mg/kg
Carbon disulfide	6	1	16.66667	780	780	988,000	9,880	NA	ug/kg
Dibenzofuran	6	1	16.66667	87	87	NA	NA	NA	ug/kg
Ethylbenzene	6	2	33.33333	1200	614	932,000	9,320	NA	ug/kg
Methylene chloride	6	4	66.66667	13	5.6	578	5.78	NA	ug/kg
Naphthalene	9	4	44.44444	12000	4685	10,100,000	101,000	NA	ug/kg
Phenanthrene	6	2	33.33333	260	166	NA	NA	NA	ug/kg
Plutonium-239/240	1	1	100	0.03323	0.03323	1,088	252	0.02	pCi/g
Pyrene	6	1	16.66667	57	57	397,000,000	3,970,000	NA	ug/kg
Tetrachloroethene	6	2	33.33333	33	17	3,150	31.5	NA	ug/kg
Uranium-235	7	4	57.14286	0.296	0.2055	113	24	0.12	pCi/g
Uranium-238	7	4	57.14286	4.33	2.815	506	103	1.49	pCi/g
Xylenes (total)	6	2	33.33333	7900	4040	9,740,000	97,400	NA	ug/kg

Bkgrd -- background plus two standard deviations

RL -- reporting limit

- Tier II values for nonradionuclides represent either 1E+06 carcinogenic risk or a hazard index of 1 for noncarcinogenic toxicity
- Tier II values for radionuclides are based on an annual dose limit of 15 mrem to a hypothetical future resident
- Tier I values for nonradionuclides represent either 1E+04 carcinogenic risk or a hazard index of 1 for noncarcinogenic toxicity
- Tier I values for radionuclides are based on an annual dose limit of 85 mrem to a hypothetical future resident

**Table 2.8 Tank 40 Surface Soil Summary Statistics for Historical and Newly Acquired Data**

Analyte	Total Samples Collected	Total Samples Greater Than Bkgrd or RL	Detection Frequency (%)	Maximum Results	Average Results	Tier I Action Level	Tier II Action Level	Background Level	Result Unit
2-Pentanone, 4-Hydroxy-4-Methyl	2	2	100	5800	5650	NA	NA	NA	ug/kg
4-Methyl-3-Penten-2-One	3	3	100	530	440	NA	NA	NA	ug/kg
Acenaphthene	3	1	33 33333	51	51	115,000,000	115,000 000	NA	ug/kg
Anthracene	3	1	33 33333	46	46	576,000,000	576,000,000	NA	ug/kg
Benzo(a)anthracene	3	3	100	230	120 6666667	614,000	6,140	NA	ug/kg
Benzo(a)pyrene	3	3	100	230	115	61,400	614	NA	ug/kg
Benzo(b)fluoranthene	3	3	100	420	204	614,000	6,140	NA	ug/kg
Benzo(ghi)perylene	3	2	66 66667	230	135	NA	NA	NA	ug/kg
Beryllium	3	1	33 33333	2 1	2 1	104	1 04	0 966	mg/kg
Calcium	3	3	100	33900	30700	NA	NA	4467	mg/kg
Chrysene	3	3	100	270	137	61,400,000	614,000	NA	ug/kg
Fluoranthene	3	3	100	530	273 3333333	76,800,000	76,800,000	NA	ug/kg
Heptane, 3,4-Dimethyl-	1	1	100	160	160	NA	NA	NA	ug/kg
Indeno(1,2,3-cd)pyrene	3	2	66 66667	100	72 5	614,000	6,140	NA	ug/kg
Methylene chloride	3	2	66 66667	6	4	239,000,000	598,000	NA	ug/kg
Phenanthrene	3	3	100	320	169 3333333	NA	NA	NA	ug/kg
Pyrene	3	3	100	520	266 6666667	57,600,000	57,600,000	NA	ug/kg
Sodium	3	2	66 66667	132	129 5	NA	NA	91 84	mg/kg
Strontium	3	2	66 66667	63 5	57 3	1,000,000	1,000,000	48 94	mg/kg
Uranium-234	3	2	66 66667	5 118	3 946	1,738	307	2 253	pCi/g
Uranium-235	3	2	66 66667	0 1863	0 16565	135	24	0 0939	pCi/g
Zinc	3	1	33 33333	79.2	79 2	576,000	576,000	73 76	mg/kg

Bkgrd – background plus two standard deviations

RL – reporting limit

- Tier II values for nonradionuclides represent either 1E+06 carcinogenic risk or a hazard index of 1 for noncarcinogenic toxicity
- Tier II values for radionuclides are based on an annual dose limit of 15 mrem to a hypothetical future resident
- Tier I values for nonradionuclides represent either 1E+04 carcinogenic risk or a hazard index of 1 for noncarcinogenic toxicity
- Tier I values for radionuclides are based on an annual dose limit of 85 mrem to a hypothetical future resident

**Table 2.9 Tank 40 Sample Results Greater Than Tier II Action Levels**

Sampling Location	Sample Type	Analyte	Result	Tier I AL	Tier II AL	Bkgrd	Unit	Validation Qualifier
04895	Historical/ Subsurface	Methylene chloride	6	578	5 78	NA	ug/kg	J
04995	Historical/ Subsurface	Methylene chloride	13	578	5 78	NA	mg/kg	J
04995	Historical/ Subsurface	Tetrachloroethene	33	3150	31 5	NA	ug/kg	J
04995	Historical/ Surface	Beryllium	2 1	104	1 04	0 966	mg/kg	None
05095	Historical/ Subsurface	Methylene chloride	6	578	5 78	NA	ug/kg	J

J - Estimated value

- Tier II values for nonradionuclides represent either 1E+06 carcinogenic risk or a hazard index of 1 for noncarcinogenic toxicity
- Tier II values for radionuclides are based on an annual dose limit of 15 mrem to a hypothetical future resident
- Tier I values for nonradionuclides represent either 1E+04 carcinogenic risk or a hazard index of 1 for noncarcinogenic toxicity
- Tier I values for radionuclides are based on an annual dose limit of 85 mrem to a hypothetical future resident

#### Responses to Operation or Occurrence

The accelerated action included removal of Tank 40 Debris associated with the upper vault was disposed of as sanitary waste, and the two tanks were disposed of as low-level radioactive waste Remedial activities were conducted between April 19 and July 18, 2002 Details are provided in the Closeout Report for IHSS Group 800-6 (DOE 2002)

Soil samples were collected and analyzed after Tank 40 was removed at Locations CF38-017, CF38-018, and CF38-024 (Figure 2 3) Sampling results indicate all contaminant concentrations at these locations were less than RFCA Tier II ALs

#### Fate of Constituents Released to Environment

No confirmed or reported releases are known to have been reported in the Tank 40 Process Waste Transfer System Based upon review of the analytical data presented in this PAC narrative update, it is unlikely that Tank 40 presented an actual or potential risk to human health or the environment

#### Action/No Further Action Recommendation

Tank 40 was excavated and packaged for disposal in Fiscal Year (FY)2002 Sampling results from the soil beneath the removed tank (i e , newly acquired data) show all contaminant concentrations are less than RFCA Tier II ALs Historical data show the presence of methylene chloride and PCE above Tier II ALs, however, the historical data are qualified and most likely no longer representative (i e , soil removed) These concentrations are slightly above Tier II ALs and considerably less than the Tier I ALs (Table 2 7 and 2 9) Also, recent results for methylene chloride and PCE from locations CF38-17 and CF38-018 indicate that these VOCs may no longer be present at concentrations exceeding Tier II ALs Historical concentrations at locations 05095 and 04995 exceeded the Tier II ALs, however, recent concentrations at locations CF38-017 and CF38-018, which are very close to locations 05095 and 04995, were less than the Tier II

ALs In addition, the beryllium concentration in surface soil (location 04995) was considerably less than the Tier I AL Therefore, the potential risk to human health or the environment appears to be very low

Based upon the above-mentioned remedial actions associated with the Under Building Contamination (UBC) Site 889 Project, the actions taken and results of sampling confirm that NFA is justified or warranted Historical concentrations exceeded Tier II ALs, however, concentrations were considerably less than the Tier I ALs No potential contaminant source or remnant concentrations could be associated with Tank 40 once it was removed and all recent data is below Tier II ALs Therefore, in accordance with RFCA (DOE, et al 1996), OPWL Tank 40 is being proposed for No Further Action

#### Comments

None

#### References

DOE, 1992, Historical Release Report for the Rocky Flats Plant, Rocky Flats Plant, Golden, CO, June

DOE, CDPHE, EPA, 1996, Final Rocky Flats Cleanup Agreement, Department of Energy, Rocky Flats Environmental Technology Site, Golden, CO, July

DOE, 2000, Industrial Area Data Summary Report, Rocky Flats Environmental Technology Site, Golden, CO

DOE, 2001, Industrial Area Sampling and Analysis Plan, Addendum #IA-02-01, Rocky Flats Environmental Technology Site, Golden, CO, November

DOE, 2002, Draft IHSS Group 800-6 Closeout Report for Rocky Flats Environmental Technology Site, Golden, CO, September

K-H, 2002, Buffer Zone Sampling and Analysis Plan, Addendum # BZ-02-01, Rocky Flats Environmental Technology Site, Golden, CO, April

**PAC REFERENCE NUMBER: 100-148**

IHSS Number 148, OU 13

Unit Name Waste Leaks (IAG Name Waste Spills)

Location N749,000, E2,082,000 (Building 123)

Date(s) of Operation or Occurrence

No documentation was found that detailed the dates of occurrence. Building 123 was first occupied in 1953. It is believed that leaks of process waste could have occurred from the start of operations up to approximately 1975.

Description of Operation or Occurrence

Persons interviewed for the Comprehensive Environmental Assessment and Response Program (CEARP) Phase 1 document indicated that several small spills of nitrate-bearing wastes occurred around the outside of Building 123. These wastes may have contained radionuclides. Additionally, interviewees indicated that there were potential releases of nitrate-bearing wastes from the OPWL buried beneath Building 123. This pipeline was in use from the start of operations in Building 123 until the OPWL were replaced by the New Process Waste Lines (NPWL). The abandonment of the OPWL beneath Building 123 occurred no later than February 1975 when engineering drawings documented the abandonment of the OPWL system. The OPWL were typically abandoned in-place.

Building 123 was serviced by a 4-inch-diameter process waste line buried beneath the north and east wings of the building. The main process waste line drained from west to east in the north wing, and from north to south in the east wing. The pipe was sloped at 1 percent. A number of connections were made to the main pipe, some of which consisted of headers servicing a number of process waste drains in the building. The pipe was probably constructed of a type of iron called "Duriron." The OPWL piping from Building 123 led to an underground tank system behind Building 441 that collected wastes generated by both Buildings 123 and 441. From this tank system, the process waste materials were pumped out for treatment in the process waste system.

The OPWL drain was not double-contained, and varied in depth from approximately 0.5 to 3 feet beneath the bottom of the concrete floor of Building 123. The line came out from beneath the southern end of the east wing of the building, with an invert elevation of approximately 6,032.5 feet. Interviewees have stated that this line, being constructed of a type of iron, probably leaked considerable amounts of waste without personnel being aware of the leak. The types of waste consisted of laboratory wastes from analysis of urine, fecal, and other bioassay samples. Nitrates and low levels of radionuclides were associated with the wastes carried in the OPWL. The

NPWL that replaced the OPWL consisted of either double contained or overhead lines (DOE 2000a) Leakage from the NPWL would be easily detected

IHSS Group 100-4, which includes IHSS 100-148, is shown in Figure 2 4 Process waste lines and sampling locations are also shown

#### Physical/Chemical Description of Constituents Released

Building 123, the Health Physics Laboratory, generated low-level radioactive waste as well as chemical wastes Process wastes reportedly leaked from the OPWL, including nitrate-bearing wastes that may have contained radionuclides Unconfirmed reports of contaminant spills were also indicated in interviews with building employees In the late 1960s or early 1970s, a cesium-contaminated liquid was reportedly spilled on the concrete floor in Room 109 The floor was immediately sealed to immobilize the contamination Room 109 also contained source storage pits Undocumented thorium research was performed in Room 105 Scoping surveys conducted in May through July 1997 revealed elevated levels of radioactivity in both Rooms 105 and 109 In-situ gamma spectroscopic measurements performed in August 1997 indicated the presence of cesium-137 and thallium-232 in Rooms 109 and 105, respectively (RMRS 1998)

As described in Industrial Area (IA) Sampling and Analysis Plan (SAP) Addendum #IA-02-01 (DOE 2001a), potential contaminants of concern (PCOCs) at IHSS 148 were determined based on data collected during the characterization of Under Building Contamination (UBC) Site 123, as summarized in the Final Data Summary Report for the Characterization of UBCs 123 and 886 (DOE 2001b), and data collected during previous studies (DOE 2001c, DOE 2000b) These pre-accelerated action data, greater than background plus two standard deviations or MDLs, along with Rocky Flats Cleanup Agreement (RFCA) Tier I and Tier II Action Levels (ALs) are referenced in the Draft Closeout Report Because a sufficient number of samples were collected during previous studies to characterize IHSS 148, additional characterization was not required Results from previous sampling and analysis of surface and subsurface soil at UBC Site 123 and IHSS 148 indicated that

- Lead was detected in subsurface soil above the Tier I AL at one location,
- Radionuclides and metals were detected at concentrations above background plus two standard deviations at UBC Site 123 and IHSS 148,
- An arsenic concentration exceeding the Tier II AL but below background was detected at one location in surface soil,
- A beryllium concentration exceeding the Tier II AL was detected at one location in surface soil, and
- Methylene chloride was detected in subsurface soil at levels slightly above the RFCA Tier II AL



## Responses to Operation or Occurrence

The accelerated action included removal of the Building 123 slab, footers, source pits, manholes, sumps, process waste lines, and contaminated soil, as well as site reclamation. Activities were conducted between January 29 and April 18, 2002. Details are provided in the Closeout Report for IHSS Groups 100-4 and 100-5 (DOE 2002a).

Confirmation sampling and analysis was conducted, after excavation and before backfilling, to verify accelerated action goals. Confirmation sampling results indicate that all contaminant concentrations are less than RFCA Tier II ALs. Figure 2.5 and Table 2.10 present confirmation sampling results that are greater than background plus two standard deviations or MDLs, along with RFCA Tier I and Tier II ALs for reference.

**Table 2.10 Confirmation Sampling Results Greater Than Background Plus Two Standard Deviations or Method Detection Limits**

Location Code	Analyte	Result (pCi/g)	Background Plus Two Standard Deviations (pCi/g)	Tier II AL (pCi/g)	Tier I AL (pCi/g)
BU39-0001	Uranium-238	3.03	1.49	506.00	103.00
BU39-0004	Americium-241	0.08	0.02	209.00	38.00
BU39-0011	Uranium-238	3.09	1.49	506.00	103.00
BV39-0003	Uranium-235	0.30	0.12	113.00	24.00
	Uranium-235	0.23	0.12	113.00	24.00
	Uranium-238	3.70	1.49	506.00	103.00
	Uranium-238	5.06	1.49	506.00	103.00
Eastern Process Line	Americium-241	0.13	0.02	209.00	38.00
	Plutonium-239/240	0.06	0.02	1,088.00	252.00
	Uranium-238	2.47	1.49	506.00	103.00
Northern Process Line	Plutonium-239/240	0.11	0.02	1,088.00	252.00
	Uranium-235	0.15	0.12	113.00	24.00

- Tier II values for nonradionuclides represent either 1E+06 carcinogenic risk or a hazard index of 1 for noncarcinogenic toxicity
- Tier II values for radionuclides are based on an annual dose limit of 15 mrem to a hypothetical future resident
- Tier I values for nonradionuclides represent either 1E+04 carcinogenic risk or a hazard index of 1 for noncarcinogenic toxicity
- Tier I values for radionuclides are based on an annual dose limit of 85 mrem to a hypothetical future resident

Residual contamination, consisting of confirmation sampling locations and pre-accelerated action sampling locations that were not remediated, are shown on Figure 2.6 and summarized in Table 2.11. Additional removal actions beyond Environmental Restoration (ER) RFCA Standard Operating Protocol (RSOP) Notification #IA-02-01 accelerated action goals (DOE 2002b) were not required at IHSS 100-4 because of the following:

- Residual radionuclide activities in subsurface soil were less than RFCA Tier II ALs and only slightly greater than background plus two standard deviations
- Residual lead concentrations in subsurface soil were less than the Tier II AL and only slightly greater than background plus two standard deviations

Table 2.11 Residual Contamination at IHSS 148

Location	Analyte	Media	Residual Concentration	Units	Background Plus Two Standard Deviations	MDL	Tier II AL (pCi/g)	Tier I AL (pCi/g)
BU38-0005	Americium-241	Subsurface Soil	0.05	pCi/g	0.02	NA	209	38
BU39-0004	Americium-241	Subsurface Soil	0.08	pCi/g	0.02	NA	209	38
Eastern Process Line	Americium-241	Subsurface Soil	0.13	pCi/g	0.02	NA	209	38
Eastern Process Line	Plutonium-239/24	Subsurface Soil	0.06	pCi/g	0.02	NA	1,088	252
Northern Process Line	Plutonium-239/24	Subsurface Soil	0.11	pCi/g	0.02	NA	1,088	252
SS306893	Americium-241	Surface Soil	0.03	pCi/g	0.02	NA	215	38
SS306793	Americium-241	Surface Soil	0.12	pCi/g	0.02	NA	215	38
	Beryllium	Surface Soil	1.20	mg/kg	0.97	NA	104	1
	Cobalt	Surface Soil	28.70	mg/kg	10.91	NA	115,000	115,000
SS307093	Americium-241	Surface Soil	0.03	pCi/g	0.02	NA	215	38
	Copper	Surface Soil	25.10	mg/kg	18.06	NA	71,100	71,100
	Lead	Surface Soil	152.00	mg/kg	54.62	NA	1,000	1,000
	Plutonium-239/240	Surface Soil	0.16	pCi/g	0.02	NA	1,429	252
	Zinc	Surface Soil	113.00	mg/kg	73.76	NA	576,000	576,000
SS307293	Cobalt	Surface Soil	11.30	mg/kg	10.91	NA	115,000	115,000
	Americium-241	Surface Soil	0.05	pCi/g	0.02	NA	215	38
SS307393	Americium-241	Surface Soil	0.03	pCi/g	0.02	NA	215	38
	Copper	Surface Soil	22.70	mg/kg	18.06	NA	71,100	71,100
	Lead	Surface Soil	128.00	mg/kg	54.62	NA	1,000	1,000
	Plutonium-239/240	Surface Soil	0.17	pCi/g	0.02	NA	1,429	252
	Zinc	Surface Soil	134.00	mg/kg	73.76	NA	576,000	576,000
SS307593	Americium-241	Surface Soil	0.02	pCi/g	0.02	NA	215	38
	Lead	Surface Soil	165.00	mg/kg	54.62	NA	1,000	1,000
	Zinc	Surface Soil	85.50	mg/kg	73.76	NA	576,000	576,000
SS307693	Americium-241	Surface Soil	0.19	pCi/g	0.02	NA	215	38
	Barium	Surface Soil	203.00	mg/kg	141.26	NA	133,000	133,000
	Copper	Surface Soil	19.80	mg/kg	18.06	NA	71,100	71,100
	Strontium	Surface Soil	94.70	mg/kg	48.94	NA	1,000,000	1,000,000
	Uranium-238	Surface Soil	2.14	pCi/g	2.00	NA	566	103

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Table 2.11 Residual Contamination at IHSS 148

Location	Analyte	Media	Residual Concentration	Units	Background Plus Two Standard Deviations	MDL	Tier II AL (pCi/g)	Tier I AL (pCi/g)
	Zinc	Surface Soil	133.00	mg/kg	73.76	NA	576,000	576,000
	Acetone	Subsurface Soil	23	µg/kg	NA	13	27,200,000	272,000
HDD-2-07	Methylene Chloride	Subsurface Soil	25	µg/kg	NA	6	578	6
	bis(2-Ethylhexyl)phthalate	Subsurface Soil	1200	µg/kg	NA	340	311,000,000	3,110,000
	Copper, Total	Subsurface Soil	182	µg/kg	38.21	0.10	71,100	71,100
1	Methylene Chloride	Subsurface Soil	7.00	µg/kg	NA	6	578	6
11	Acetone	Subsurface Soil	30.00	µg/kg	NA	13	27,200,000	272,000
	Naphthalene	Subsurface Soil	13.00	µg/kg	NA	11	10,100,000	101,000
12	1,2,4-Trichlorobenzene	Subsurface Soil	6.00	µg/kg	NA	5	433,000	4,330
	Acetone	Subsurface Soil	69.00	µg/kg	NA	5	27,200,000	272,000
	Bis(2-Ethylhexyl)phthalate	Subsurface Soil	50.00	µg/kg	NA	10	311,000,000	3,110,000
	Methylene Chloride	Subsurface Soil	34.00	µg/kg	NA	5	578	6
	Naphthalene	Subsurface Soil	13.00	µg/kg	NA	11	10,100,000	101,000
	Uranium-235	Subsurface Soil	0.20	pCi/g	0.12	NA	135	24
13	Carbon Tetrachloride	Subsurface Soil	11.00	µg/kg	NA	6	3,560	36
	Methylene Chloride	Subsurface Soil	34.00	µg/kg	NA	5	578	6
	Naphthalene	Subsurface Soil	16.00	µg/kg	NA	11	10,100,000	101,000
16	Acetone	Subsurface Soil	6.00	µg/kg	NA	5	27,200,000	272,000
	Benz(a)pyrene	Subsurface Soil	760.00	µg/kg	NA	730	701,000	7,010
	Fluoranthene	Subsurface Soil	1500.00	µg/kg	NA	730	537,000,000	5,370,000
	Pyrene	Subsurface Soil	1300.00	µg/kg	NA	730	397,000,000	3,970,000
17	Acetone	Subsurface Soil	8.00	µg/kg	NA	6	27,200,000	272,000
	Plutonium-239/240	Subsurface Soil	0.03	pCi/g	0.02	NA	1,429	252
18	Acetone	Subsurface Soil	18.00	µg/kg	NA	5	27,200,000	272,000
	Fluoranthene	Subsurface Soil	1200.00	µg/kg	NA	710	537,000,000	5,370,000
	Naphthalene	Subsurface Soil	10.00	µg/kg	NA	5	10,100,000	101,000
	Plutonium-239/240	Subsurface Soil	0.09	pCi/g	0.02	NA	1,429	252

Table 2.11 Residual Contamination at IHSS 148

Location	Analyte	Media	Residual Concentration	Units	Background Plus Two Standard Deviations	MDL	Tier II AL (pCi/g)	Tier I AL (pCi/g)
	Pyrene	Subsurface Soil	1100.00	µg/kg	NA	710	397,000,000	3,970,000
19	Naphthalene	Subsurface Soil	10.00	µg/kg	NA	5	10,100,000	101,000
20	Acetone	Subsurface Soil	99.00	µg/kg	NA	6	27,200,000	272,000
21	Plutonium-239/240	Subsurface Soil	0.13	pCi/g	0.02	NA	1,429	252
22	Americium-241	Subsurface Soil	0.10	pCi/g	0.02	NA	215	38
3	Americium-241	Subsurface Soil	0.10	pCi/g	0.02	NA	215	38
	Fluoranthene	Subsurface Soil	410.00	µg/kg	NA	360	537,000,000	5,370,000
	Pyrene	Subsurface Soil	420.00	µg/kg	NA	360	397,000,000	3,970,000
4	Fluoranthene	Subsurface Soil	480.00	µg/kg	NA	350	537,000,000	5,370,000
	Pyrene	Subsurface Soil	540.00	µg/kg	NA	350	397,000,000	3,970,000
8	Fluoranthene	Subsurface Soil	810.00	µg/kg	NA	370	537,000,000	5,370,000
	Pyrene	Subsurface Soil	740.00	µg/kg	NA	370	397,000,000	3,970,000
HDD-2-01	Methylene Chloride	Subsurface Soil	29.00	µg/kg	NA	6	578	6

- Tier II values for nonradionuclides represent either 1E+06 carcinogenic risk or a hazard index of 1 for noncarcinogenic toxicity
- Tier II values for radionuclides are based on an annual dose limit of 15 mrem to a hypothetical future resident
- Tier I values for nonradionuclides represent either 1E+04 carcinogenic risk or a hazard index of 1 for noncarcinogenic toxicity
- Tier I values for radionuclides are based on an annual dose limit of 85 mrem to a hypothetical future resident

- Residual semivolatile organic compound (SVOC) concentrations were less than Tier II ALs
- Radionuclide activities in surface soil were less than Tier II ALs and only slightly greater than background plus two standard deviations (DOE 2002b)
- A beryllium concentration in surface soil, outside of UBC 123, IHSS 148, and PAC 100-611 but within the AOC, at only one location and was 0.16 milligrams per kilogram (mg/kg) greater than the RFCA Tier II AL
- Methylene chloride concentrations in subsurface soil, outside of UBC Site 123, IHSS 148, and PAC 100-611 but within the Area of Concern (AOC), were greater than the RFCA Tier II AL at six locations. Methylene chloride does not pose a significant risk at these concentrations. Additionally, methylene chloride was found in laboratory blanks associated with the data set
- All excavated areas were backfilled and revegetated after confirmation sampling results were received and discussed with regulatory agencies through the consultative process. Excavated soil with radionuclide activities less than RFCA Tier II ALs was used as backfill in the trench from which it was removed. Additionally, 32 end-dump loads of topsoil from offsite sources were used to bring excavated areas up to grade
- The IHSS Group 100-4 area was rough-graded before topsoil was distributed over the site. The topsoil was graded, then scarified, and a seed mix consisting of Canada bluegrass was spread over the site using broadcast seeding methods. Hydromulch was applied to conserve moisture and prevent seed erosion

#### Fate of Constituents Released to Environment

Sumps and process waste lines within IHSS 100-148 were excavated and packaged for disposal. Confirmation sampling results from the soil beneath the sumps and process waste lines indicated that all contaminant concentrations were less than RFCA Tier II ALs. Therefore, there is no actual or potential risk to human health or the environment.

#### Action/No Further Action Recommendation

Based upon characterization sample results collected in accordance with IASAP Addendum #IA-02-01 (DOE 2001a), no potential contaminant or residual contaminant source could be identified. Residual analytical soil concentrations for contaminants of concern (COCs) are shown on Table 2.11 as well as Figure 2.6 (UBC Site 123). Therefore, in accordance with RFCA (DOE 1996), IHSS 148 (PAC 100-148) is proposed for No Further Action at this time.

#### Comments

None

## References

DOE, 2000b, Industrial Area Data Summary Report, Rocky Flats Environmental Technology Site, Golden, CO, September

DOE, 2000a, Final Sampling and Analysis Plan for the Characterization of Under Building Contamination for UBC 123 and Building 886 Implementing Horizontal Directional Drilling and Environmental Measurement While Drilling, Rocky Flats Environmental Technology Site, Golden, Colorado, May

DOE, 2001c, Industrial Area Sampling and Analysis Plan, Rocky Flats Environmental Technology Site, Golden, CO, June

DOE 2001a, Industrial Area Sampling and Analysis Plan Addendum #IA-02-01, Rocky Flats Environmental Technology Site, Golden, CO, November

DOE 2001b, Final Data Summary Report for the Characterization of UBCs 123 and 886, Rocky Flats Environmental Technology Site, Golden, CO, September

DOE 2002a, Draft Closeout Report for IHSS Groups 100-4 and 100-5, Rocky Flats Environmental Technology Site, Golden, CO, July

DOE 2002b, Environmental Restoration RFCA Standard Operating Protocol Notification #02-01, Rocky Flats Environmental Technology Site, Golden, CO, January

RMRS, 1997, Closure Plan for the Building 123 Components of RCRA Unit 40, Rocky Flats Environmental Technology Site, Golden, CO, November

RMRS, 1998, Proposed Action Memorandum for the Decommissioning of Building 123, RF/RMRS-97-012, Rocky Flats Environmental Technology Site, Golden, CO, March

**PAC REFERENCE NUMBER: 100-603**

IHSS Reference Number      Not Applicable

Unit Name                      Building 123 Bioassay Waste Spill

Location                        N749,000, E2,082,000 (Southwest of Building 123)

Date(s) of Operation or Occurrence

June 9, 1989

Description of Operation or Occurrence

An underground process waste line from Building 123 was being excavated and replaced due to a break in the line (PAC 100-602) The excavated end of the broken line was temporarily capped with a plastic bag, and process waste from Building 123 was rerouted to bypass the broken line The pump used to reroute the waste failed and allowed some of the waste to overflow into the broken line Part of this waste leaked around the plastic bag and into the excavation where the broken line was capped The release occurred within the excavation Rainwater that was being pumped out of the trench at the time of the spill was not contaminated, as confirmed by sampling (DOE 1992)

Physical/Chemical Description Constituents Released

The release consisted of bioassay waste containing hydrochloric acid and nitric acid with a pH of approximately 1 The waste also may have contained urine, and up to a combined total of 1 5 gallons of ammonium thiocyanate, ammonium iodide, and ammonium hydroxide The calculated maximum volume of the release was 30 gallons Due to inclement weather, the released material mixed with rainwater in the excavation

Responses to Operation or Occurrence

The release was contained within the trench and within 8 feet of the building with berms as confirmed by sampling Based on this, rainwater being pumped from the trench at the time of the release at locations farther than 8 feet from the building and both south and southwest of the building was not contaminated by the release The potentially contaminated rainwater contained within the bermed area of the trench totaled approximately 100 gallons and was neutralized, pumped and treated at Building 374

Samples were collected to evaluate the spread of contamination The release was documented in Resource Conservation and Recover Act (RCRA) Contingency Plan Implementation Report No 89-006 (DOE 1989)

In late 2000, four subsurface soil samples were collected in and around PAC 100-603 as part of the Under Building Contamination (UBC) Site 123 characterization project. Each sample was analyzed for volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), total metals, and isotopic radionuclides.

Analytical data for the chemical and radiological soil samples collected at locations HDD-3-01 and HDD-3-02 were verified and validated consistent with the data quality objective (DQO) decision rules for the UBC Site 123 Characterization Project (Figure 2.7). Upon completion of data analysis for that project, it was determined that no environmental remediation action was necessary relative to radiological or hazardous constituents at UBC Site 123. A more detailed explanation of the data analysis is presented in the Final Data Summary Report for the Characterization of UBCs 123 and 886 (DOE 2001a).

Samples from locations HDD-3-Trench-A and HDD-3-Trench-B were collected within the PAC boundaries at approximately 20 inches below the top of existing asphalt. VOC and SVOC concentrations were reported at below method detection limits (MDLs) (U-qualified by the labs) or well below Rocky Flats Cleanup Agreement (RFCA) Tier II Action Levels (ALs). Radionuclide and metal results were reported to be nondetect (U-qualified by the labs) or at levels below Site mean background plus two standard deviations (with the exception of those analytes in Table 2.12 below). All of the reported concentrations were significantly below the RFCA Tier II ALs.

**Table 2.12 Analytes Exceeding Background Mean Plus Two Standard Deviations**

Sampling Location	Analytical Concentration mg/kg or pCi/g	Tier I Action Level	Tier II Action Level	Mean Background Concentration	Background Mean + 2 Stand. Deviations*
HDD-3-Trench-A	Cadmium – 3.5	2040 mg/kg	2040 mg/kg	0.82 mg/kg	1.70 mg/kg
HDD-3-Trench-A	Lead – 36.8	1000 mg/kg	1000 mg/kg	10.87 mg/kg	24.97 mg/kg
HDD-3-Trench-B	Am-241 – 0.100 (J-qualified)	209 pCi/g	38 pCi/g	0.00 pCi/g	0.02 pCi/g
HDD-3-Trench-B	Cadmium – 5.3	2040 mg/kg	2040 mg/kg	0.82 mg/kg	1.70 mg/kg
HDD-3-Trench-B	Lead – 66.9	1000 mg/kg	1000 mg/kg	10.87 mg/kg	24.97 mg/kg

Source: K-H, 2001b, Industrial Area Sampling and Analysis Plan, Tables F-4 and F-5, RFETS, June

- Tier II values for nonradionuclides represent either 1E+06 carcinogenic risk or a hazard index of 1 for noncarcinogenic toxicity
- Tier II values for radionuclides are based on an annual dose limit of 15 mrem to a hypothetical future resident
- Tier I values for nonradionuclides represent either 1E+04 carcinogenic risk or a hazard index of 1 for noncarcinogenic toxicity
- Tier I values for radionuclides are based on an annual dose limit of 85 mrem to a hypothetical future resident

### Fate of Constituents Released to Environment

Results from 11 samples collected shortly after the incident to evaluate the spread of contamination indicated that contamination was restricted to the excavation within 8 feet of Building 123. Rainwater potentially contaminated by the spill was neutralized, pumped from the excavation, and transferred to the process waste system for treatment in Building 374.









### Action/No Further Action Recommendation

Results of the analyses are summarized in Table 2 12 along with the appropriate RFCA ALs All of analytical results were below RFCA ALs

The regulatory agencies agreed to No Further Action (NFA) as proposed in the 2001 Historical Release Report (HRR) Annual Update on December 19, 2001 Clarification was provided in the Quarterly Letter (#32 of AR1) related to the rainwater in the trench and specifically where the release occurred (i e , within the excavation) This PAC narrative has been rewritten for clarity However, due to additional information being collected as part of the UBC Site 123 characterization project and the previously requested clarification, in accordance with RFCA (DOE 1996) per the joint Agency letter of February 14, 2002, PAC 100-603 is NFA

### Comments

Analytical results for HDD-3-01 and HDD-3-02 are included in the Final Data Summary Report for the Characterization of UBCs 123 and 886 (K-H 2001a)

It should be noted that the original HRR (DOE 1992) mentions that the waste stream for Building 123, a bioassay laboratory, may have had small concentrations of ammonium thiocyanate, ammonium iodide and ammonium hydroxide While these compounds were not specifically sampled for in Fiscal Year (FY)2000, it is very unlikely that RFCA Tier II ALs could have been exceeded The RFCA Tier II ALs for ammonium and cyanide are greater than 1 million and greater than 40,900 parts per million, respectively

During the NFA status meetings held between October 2001 and April 2002, between DOE, Kaiser-Hill Company, L L C , Environmental Protection Agency, and the Colorado Department of Public Health and Environment, it was agreed that clarification to the PAC narrative for PAC 100-603 would be included in the Working Group Quarterly letters to clarify issues related to the rainwater in the trench and specifically where the release occurred (i e , within the excavation) This revised PAC narrative has been rewritten to include clarification and incorporate new data

### References

DOE, 1989, RCRA Contingency Plan Implementation Report No 89-006, Rocky Flats Plant, Golden, CO, June

DOE, 1992, Historical Release Report for the Rocky Flats Plant, Rocky Flats Plant, Golden, CO, June

DOE, CDPHE, EPA, 1996, Final Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, CO, July

K-H, 2001a, Final Data Summary Report for the Characterization of UBC Sites 123 and 886, Rocky Flats Environmental Technology Site, Golden, CO, August

DOE, 2001b, Industrial Area Sampling and Analysis Plan, Appendix Tables F-4 and F-5, Rocky Flats Environmental Technology Site, Golden, CO, June

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The Area of Concern (AOC), shown on Figure 2 8, was determined based on analytical results from IASAP Addendum #IA-02-01 (DOE 2001b) sampling. The AOC is defined as the area with contaminant concentrations greater than method detection limits (MDLs). The AOC map also illustrates the limits of Rocky Flats Cleanup Agreement (RFCA) Tier II and Tier I Action Level (AL) exceedances for PCBs. Because there are no existing RFCA ALs for dioxin/furans, a different framework was used for comparison of analytical results. Both Environmental Protection Agency (EPA) cleanup guidelines (EPA 1998) for residential and industrial use (in accordance with RFCA) and a value of 9 toxicity equivalents (TEQs) (consultative process) were used for comparison. Results for dioxin/furan were converted to TEQ using a toxicity equivalency factor (TEF) in accordance with SW8290 (EPA 1994) and a recent World Health Organization (WHO) (WHO 1995) and compared directly with the TEQ of 9. The TEQ values for dioxin congeners are summed for each sampling location and the TEQ values for furan congeners were summed for each sampling location. These data are presented in Table 2 15. As shown on Table 21(2 15) there are no exceedances of the 9ppt TEQ for the summed dioxin compounds. All summated TEQ values are well within the cited Front Range background range of 0.1 to 155 TEQ. This comparison is shown in Table 2 15. There were no exceedances of the TEQ. Additionally, there were no exceedances of RFCA Tier II or Tier I ALs (PCBs) or EPA cleanup guidelines.

In accordance with the IASAP Addendum #IA-02-01 (DOE 2001), the AOC based on characterization data becomes the revised PAC shape. This change will be archived through the Site Geographic Information Services Group and is reflected on Plate 2 (Appendix 4).

There are no qualifications of the data. Results indicate that no chemical contamination exists in excess of RFCA Tier I or Tier II ALs for PCBs, or for dioxins/furans in excess of TEQ.

#### Accelerated Action Description

The accelerated action objectives were developed and described in Environmental Restoration (ER) RFCA Standard Operating Protocol (RSOP) Notification #02-01 (DOE 2002b). The accelerated action objectives for PAC 100-609 included the following:

- Remove the concrete slabs, which will be dispositioned in accordance with the RSOP for Recycling Concrete (DOE 1999), and
- Remediate soil if dioxins or furans are detected at levels greater than MDLs or levels agreed upon through the RFCA consultative process.

**Table 2.15 Summed TEQs by Sample Location**

Sampling Location	Summed Dioxin TEQ (ppt)	Summed Furan TEQ (ppt)
BT38-001	6 27	0 96
BT38-002	4 10	7 36
BT39-001	4 02	0 93
BT39-002	2 13	0 29
BT39-003	7 65	2 81
BT39-004	1 65	0 61

#### Concrete Slabs

The two slabs associated with PAC 100-609 were removed using a forklift after a corner of the slabs was broken up sufficiently with a jackhammer to gain access to the underlying soil. The main slab was 20 inches thick. One composite sample was collected from the concrete for waste characterization. The sample was analyzed for metals, dioxins, and furans. Concrete was surveyed for radiological constituents and recycled in accordance with the RSOP for Recycling Concrete (DOE 1999).

#### Soil Removal

Because all analytical results indicated that dioxin and furan concentrations were less than EPA cleanup guidelines for residential use and PCBs were less than RFCA Tier II ALs, no soil was removed. Therefore, confirmation samples were not collected because soil was not remediated. Characterization samples were analyzed at an offsite laboratory, which also serve as confirmation samples.

#### Site Reclamation

PAC 100-609 was covered with approximately 6 to 8 inches of roadbase, and wheel-rolled and compacted with a loader.

#### Fate of Constituents Released to Environment

No documentation was found detailing a release of contaminants from the operation of this incinerator.

Based on the actions taken and characterization results, there is no actual or potential risk to human health or the environment. Soil concentrations are below RFCA Tier II ALs and EPA cleanup guidelines.

#### Action/No Further Action Recommendation

Based upon the removal of the two concrete slabs and subsequent sampling in accordance with the IASAP Addendum #IA-02-01 (DOE 2001), no potential contaminant or residual contaminant source could be identified. Residual analytical soil concentrations for contaminants of concern

are shown in Table 2 14 In accordance with RFCA (DOE 1996), PAC 100-609 is proposed for No Further Action at this time

Comments

None

References

EPA, 1994, Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, Integrated Manual (SW-846), 3<sup>rd</sup> Edition, Office of Solid Waste and Emergency Response, September

EPA, 1998, EPA Cleanup Guidelines for Residential and Industrial Use

DOE, 1992, Historical Release Report for the Rocky Flats Plant, Golden, CO, September

DOE, 1999, RFCA Standard Operating Protocol for Recycling Concrete, Rocky Flats Environmental Technology Site, Golden, CO

DOE, 2001, Industrial Area Sampling and Analysis Plan Addendum #IA-02-01, Rocky Flats Environmental Technology Site, Golden, CO, November

DOE, 2002, Environmental Restoration RFCA Standard Operating Protocol Notification #02-01, Rocky Flats Environmental Technology Site, Golden, CO, January

World Health Organization, 1998, Assessment of the Health Risk of Dioxins Re-Evaluation of the Tolerable Daily Intake (TDI), WHO European Center for Environment and Health, Geneva, Switzerland, May



**PAC REFERENCE NUMBER: 100-611**

IHSS Number                      Not Applicable

Unit Name                        Building 123 Scrubber Solution Spill

Location                         N749,000, E2,082,000 (west side of Building 123)

Date(s) of Operation or Occurrence

November 7, 1989

Description of Operation or Occurrence

An inoperative pump in the Building 123 process waste transfer system caused the Building 123 scrubber system to overflow, spilling scrubbing solution into a bermed area outside of the building and into three pits beneath the floor of the building. Also, approximately 5 gallons of liquid were present in and around a nearby storm water drainage ditch that served the Building 123 parking lot. It was speculated that this liquid leaked from the berm wall interface with the underlying asphalt. However, it was later concluded that this liquid was not associated with the incident (i.e., it was in the ditch prior to the incident). All of the spilled solution was contained within secondary containment structures, and none of the solution was believed to have impacted the environment.

Under normal operating conditions, the scrubbing solution drained into the process waste system when the scrubbing process was completed. The spill occurred because waste pump switches were in the wrong position and the influent valve that was blocked by glass filtering wool from Building 123.

Normal scrubbing solution drainage was restored when the glass wool material was cleared and the inoperative process waste pump was restarted. A submersible pump was used to transfer the scrubbing solution from the bermed area to process waste drains in Building 123. Measures were proposed to prevent the subsequent buildup of glass wool in the process waste system. A Resource Conservation and Recovery Act (RCRA) Contingency Plan Implementation Report (CPIR) (89-019) was written.

All spilled materials were contained and transferred into the Building 123 process waste system for eventual treatment at Building 374.

Physical/Chemical Description of Constituents Released

The scrubbing solution consisted primarily of water, which was used to scrub nitric acid, hydrofluoric acid, and hydrochloric acid used in Building 123. Approximately 50 gallons were released to the bermed area, and several hundred gallons were contained in the three pits beneath

the Building 123 floor Analyses indicated the solution in the bermed area had a pH of 1 6, and the solution in the three pits had a pH of 6 0

The 5 gallons of liquid in the parking lot drainage ditch did not react when sodium bicarbonate was applied, indicating it was not acidic and, therefore, was not the scrubbing solution

Five samples were collected on February 5, 2002, and analyzed for pH (DOE 2001) The location of these samples and analytical results are shown on Figure 2 9 Analytical results are presented in Table 2 16 Results indicate no chemical contamination exists

**Table 2.16 PAC 100-611 Characterization Data Summary**

Location Code	Analyte	Result (S.A.)	MDL	Background Plus Two Standard Deviations	Tier II AL	Tier I AL
BU38-0010	pH	8 4	NA	NA	NA	NA
BU38-0012	pH	8 8	NA	NA	NA	NA
BU38-0013	pH	8 8	NA	NA	NA	NA
BU38-0014	pH	8 7	NA	NA	NA	NA
BU38-0015	pH	8 8	NA	NA	NA	NA

NA Not Applicable

#### Responses to Operation or Occurrence

A submersible pump was used to transfer the scrubbing solution from the bermed area to a process waste drain for eventual treatment at Building 374 Based on the results of the pH measurements, no action was required

#### Fate of Constituents Released to Environment

Based on the characterization results, there is no actual or potential risk to human health or the environment

Action/No Further Action Recommendation

Based upon the characterization sample results collected in accordance with the IA SAP Addendum #IA-02-01 (DOE 2001), no potential contaminant or residual contaminant source could be identified. Residual analytical results for the COCs (i.e. pH) are shown on Table 2.16. Therefore, in accordance with RFCA (DOE 1996), PAC 100-611 is proposed for No Further Action.

Comments

None

References

DOE, 1992, Historical Release Report for the Rocky Flats Plant, Golden, CO, June

DOE, 1996, Final Rocky Flats Cleanup Agreement, Rocky Flats Environmental Technology Site, Golden, CO, July

DOE, 2001, Industrial Area Sampling and Analysis Plan, Addendum IA-02-01, Rocky Flats Environmental Technology Site, Golden, CO, November

**PAC REFERENCE NUMBER: 500-906**

IHSS Number Not Applicable

Unit Name Asphalt Surface Near Building 559

Location N750,100, E2,083,500

Date(s) of Operation or Occurrence

March 22, 1993

Description of Operation or Occurrence

On March 22, 1993 at 2 00 p m , approximately 1 gallon of F001 wastewater spilled onto the pavement from a hose that was used to extract excess water from a tanker The water was from the P304 sump, which collects water from the exterior of the Building 559/561 tunnel and the Building 561 basement Normally this water was released into the surface water drainage system through pumping to a footing drain system that flows by gravity However, the water in question was found to exceed Segment 5 stream standards for some analytes, and was thus being removed by tanker The tanker was accidentally filled beyond the level allowed by Rocky Flats Transportation Guidelines These guidelines require that no more than four-fifths of the capacity of the tanker be used After approximately 1,000 gallons of water had been off-loaded from the tanker into drums, the hose that was used leaked some water as it was transferred back to storage

Physical/Chemical Description of Constituents Released

The water contained F001 hazardous waste constituents, including carbon tetrachloride, trichloroethene and 1,1-dichloroethene, based on four sampling events that occurred from July 1992 through March 1993 Chemical analytes covered by Toxicity Characteristic Leaching Procedure (TCLP) were also identified, but the concentrations were below those of a characteristic Resource Conservation and Recovery Act (RCRA) hazardous waste Contamination levels exceeded Segment 5 stream standards for some constituents

Responses to Operation or Occurrence

Oil-dry absorbent was used to absorb the water and was managed as RCRA-regulated hazardous waste after use in a RCRA permitted storage area The incident was reported to the regulatory agencies in CPIR No 93-004, as well as the Fourth Quarterly Update to the Historical Release Report (HRR) (DOE 1993) The HRR reporting process assigned the location as PAC 500-906

The soil immediately under the asphalt surface (PAC 500-906) was sampled in April 2002 in accordance with Industrial Area Sampling and Analysis Plan (IASAP) Addendum #IA-02-01 (DOE 2001) Two soil samples were collected and analyzed for volatile organic compounds

(VOCs) Sampling locations and results greater than method detection limits are shown in Figure 2 10 as well as Table 2 17 All analytical results were less than Rocky Flats Cleanup Agreement (RFCA) Tier II Action Levels (ALs)

**Table 2.17 PAC 500-906 Sample Results Greater Than Method Detection Limits**

Sampling Location	Analyte	Result	Tier I	Tier II	Units
CD43-001	Methylene chloride	2	2 39E +08	5 98E +05	ug/kg
CD43-002	Acetone	4 8	1 92E +08	1 92E +08	ug/kg
CD43-002	Ethylbenzene	5 5	1 92E +08	1 92E +08	ug/kg
CD43-002	Methylene chloride	1 8	2 39E +08	5 98E +05	ug/kg
CD43-002	Xylenes (total)	24	1 00E +9	1 00E +9	ug/kg

- Tier II values for nonradionuclides represent either 1E+06 carcinogenic risk or a hazard index of 1 for noncarcinogenic toxicity
- Tier II values for radionuclides are based on an annual dose limit of 15 mrem to a hypothetical future resident
- Tier I values for nonradionuclides represent either 1E+04 carcinogenic risk or a hazard index of 1 for noncarcinogenic toxicity
- Tier I values for radionuclides are based on an annual dose limit of 85 mrem to a hypothetical future resident

#### Fate of Constituents Released to Environment

Hazardous constituents released to the environment are believed to be minimal, if any, due to the small amount of material spilled on the asphalt surface and the immediate cleanup response The characterization sampling described above confirms that VOCs did not reach the underlying soil horizon

#### Action/No Further Action Recommendation

Based upon the characterization results presented in Table 2 17 and on Figure 2 10, soil concentrations are below RFCA Tier II ALs for the potential contaminants of concern and no contaminant source could be identified Further, the characterization results indicate that there is no actual or potential risk to human health or the environment and, therefore, in accordance with RFCA (DOE 1996), PAC 500-906 is proposed for No Further Action

#### Comments

In relation to this incident, the October 2000 renewal of the National Pollutant Discharge Elimination System Permit contains provisions that currently allow for the discharge of this groundwater (with restriction to volume and contaminant concentration) to the sanitary collection system (EPA 2000)

## References

DOE, 1993, Fourth Quarterly Update to the Historical Release Report, Rocky Flats  
Environmental Technology Site, Golden, CO, July

DOE, 1996, Final Rocky Flats Cleanup Agreement, Department of Energy, Rocky Flats  
Environmental Technology Site, Golden, CO, July

DOE, 2001, Industrial Area Sampling and Analysis Plan Addendum #IA-02-01 Rocky Flats  
Environmental Technology Site, Golden, CO, November

EPA, 2000, Renewal of the National Pollutant Discharge Elimination System (NPDES) Permit,  
No #CO0001333, Rocky Flats Environmental Technology Site, Golden, CO, October

**PAC REFERENCE NUMBER: 600-1005**

IHSS Number                      Not Applicable

Unit Name                        Former Pesticide Storage Area

Location                         N749,000, E2,083,000

Date(s) of Operation or Occurrence

Approximately 1982

Description of Operation or Occurrence

(Original Historical Release Report)

Building 667 was originally used to store pesticides. This site is located several hundred feet north of former Building 850 in what is currently the 881 parking lot (Figure 2 11). In approximately 1982, it is believed that the original pesticide shed (Building 667) was relocated to an area southwest of Building 371 (refer to Plate 4, Appendix 4). At this new location, the building was renamed Building 367, and pesticide storage in the shed resumed for an unknown time. The shed is no longer used for pesticide storage.

It is assumed that pesticides and herbicides were stored at the Building 667 site at least through 1978. It is possible that pesticides and/or herbicides were spilled during loading or mixing operations (DOE 1992). In addition, it is possible that the floor at the prior building location was once dirt, increasing the possibility of residual amounts of pesticides remaining at the site. No known rinsing of pesticide containers occurred at the shed.

Physical/Chemical Description of Constituents Released

Pesticides, which are regulated under the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA), were stored in this area. It is possible that some pesticides were released to the environment. A list of pesticides stored in Building 667 follows:

Spectracide 600 (ant killer),	Hyvar X-L (Bromacil weed killer),
Mouse Maze (poisoned grain for mice and pigeons),	Esteron 76BE (herbicide weed control),
Bee Bopper (bee and wasp spray, includes chlordane),	Tordon 22K (herbicide weed control),
Malkill (insecticide),	Ureabor (U S Borax granular weed and grass control),
TMTD-Rhoplex (rabbit and deer repellent),	Banvel,
Decon rodent poison grain,	Diazon,
Ortho Liquid Iron (grass fertilizer),	Poison Grain (birds),
Excel (lawn fertilizer),	Malathion, and
DM14 (herbicide weed control),	Diazinon (black widow spider)

### Responses to Operation or Occurrence

The former Building 667 location was introduced in to the Historical Release Report (HRR) system and former Operable Unit 10 in 1991. Specifically, there are no known or documented accounts of a herbicide or pesticide release to the environment, however, interviews with several plant employees stated that mixing of those compounds was fairly common practice in the shed. The pesticide shed was relocated to its present location (currently PAC 300-702) in 1982.

In accordance with Industrial Area Sampling and Analysis Plan (SAP) Addendum #IA-02-01 for IHSS Group 600-6 (K-H 2001), characterization samples were collected on April 8, 2002 (Figure 2 11). Analytical results for herbicides and pesticides from two locations were all below the method detection limits (MDS). Analytical results for characterization samples for PAC 600-1005 are presented in the Data Summary Report for Group 600-6 (K-H 2002).

### Fate of Constituents Released to Environment

There has never been a documented release from activities performed at Building 667. Further, based upon the characterization sampling results (locations shown on Figure 2 11), there does not appear to be any actual or potential risk to human health or the environment. All soil concentrations were below Rocky Flats Cleanup Agreement (RFCA) Tier II Action Levels (ALs) and specifically, below MDLs.

### Action/No Further Action Recommendation

Based upon characterization sample results collected in accordance with the Industrial Area SAP Addendum #IA-02-01 for IHSS Group 600-6 (K-H 2001), no potential contaminant source could be identified. All sample results were below the MDLs, for potential contaminants of concern and, therefore, in accordance with RFCA (DOE 1996), PAC 600-1005 is proposed for No Further Action at this time.

### Comments

Building 667 was relocated from the B881 parking lot to make room for additional parking spaces.

### References

DOE, 1992, Historical Release Report for the Rocky Flats Plant, Rocky Flats Plant, Golden, CO, June

DOE, 1996, Final Rocky Flats Cleanup Agreement, Department of Energy, Rocky Flats Environmental Technology Site, Golden, CO, July

K-H, 2002, Draft Data Summary Report for Group 600-6, PAC 600-1005, Rocky Flats Environmental Technology Site, September



**PAC REFERENCE NUMBER: 700-1106**

IHSS Number                      Not Applicable

Unit Name                        Process Waste Spill – Portal 1

Location                         N750,000, E2,084,000

Date(s) of Operation or Occurrence

November 1986

Description of Operation or Occurrence

Approximately 10 gallons of process wastewater spilled from a tank truck at the entrance to Portal 1. The truck was en route from the Valve Vault 12 leak area to Solar Evaporation Pond 207A (Building 762A). The tank was overfilled, and the liquid splashed out of the top manhole while the truck was driven around a corner.

Physical/Chemical Description of Constituents Released

Process wastewater from the Valve Vault 12 leak was released onto the street. Analysis of water samples collected from Valve Vault 12 and a related process waste line leak indicated the total alpha activity was 170,000 picocuries per liter (pCi/L) and uranium-238 activity was 120,000 pCi/L. It was determined at the time of the spill that there was no radioactivity on the street.

Responses to Operation or Occurrence

Samples were collected from Valve Vault 12 to assess the potential contamination released during the transport (noted above and provided in the PAC 300-186 narrative). Radiological surveys concluded at the time of the spill concluded that there was no radioactivity on the street. No other historical documentation could be found which further detailed a response to the release.

In accordance with the Industrial Area SAP Addendum #IA-02-01 for IHSS Group 700-12 (K-H 2001), characterization samples were collected on April 4, 2002 (Figure 2.12). Analytical results for radionuclides from two locations were well below RFCA Tier II ALs and were consistent with known background values. The data is presented on Figure 2.12. Analytical results from characterization samples for PAC 700-1106 are presented in the Data Summary Report for Group 700-12 (K-H 2002).

### Fate of Constituents Released to Environment

Because the release was relatively small (10 gallons), to an asphalt surface, and no radioactivity could be found, this incident has not posed a potential risk to human health or the environment. Further, recently collected analytical data support this fact, as shown on Figure 2.12

### Action/No Further Action Recommendation

Based on the actions taken and characterization results for soil samples collected in accordance with the Industrial Area SAP Addendum #IA-02-01, IHSS Group 700-12 (K-H 2001), no potential contaminant source or remnant concentrations could be identified for PAC 700-1106. All soil concentrations were below RFCA Tier II ALs. Therefore, in accordance with RFCA (DOE 1996), PAC 700-1106 is proposed at this time.

### Comments

None

### References

DOE, 1992, *Historical Release Report for the Rocky Flats Plant*, Golden, CO, June

DOE, 1996, *Final Rocky Flats Cleanup Agreement*, Department of Energy, Rocky Flats Environmental Technology Site, Golden, CO, July

K-H, 2001, *Industrial Area SAP Addendum #IA-02-01 for IHSS Group 700-12*, Rocky Flats Environmental Technology Site, Golden, CO, November

K-H, 2001, *Draft Data Summary Report for IHSS Group 700-12, PAC 700-1106*, Rocky Flats Environmental Technology Site, Golden, CO, September

**PAC REFERENCE NUMBERS: 700-1114A AND 700-1114B**

IHSS Reference Number Not Applicable

Unit Name Releases During Liquid Transfer Operations from B774

Occurrence Report Number RFO-KHLL-LIQWASTE-1996-0004

Approximate Location N751,126, E2,084,189

Date(s) of Operation or Occurrence

October 10 and 11, 1996

Description of Operation or Occurrence

On October 10 and 11, 1996, liquid transfer of a waste oil (contaminated with polychlorinated biphenyls [PCBs] and Resource Conservation and Recovery Act [RCRA] constituents) from Building 774 to a tanker truck resulted in several reportable/incidental releases at two separate locations. The first incident was identified when the tanker was staged temporarily west of Building 765 near the Portal 1 entrance (700-1114A). Personnel observed a liquid dripping from the vacuum pump apparatus through the exhaust/demister unit onto the pavement. After responding to the incident at Building 765, workers involved in the liquid transfer operation immediately walked down the area near Building 774 where the pumping operation had taken place earlier. Approximately the same amount of liquid was released to soil at that location (700-1114B) (DOE 1996a).

The liquid was condensate from the vacuum pump apparatus. It was estimated that approximately 1 cup of liquid was released at each location. A third release to the soil occurred at the Building 774 location the following day (700-1114B) (October 11, 1996) involving approximately 1 gallon of the same type of liquid. The release was due to the failure of a plastic bag affixed under the exhaust condensate line after the previous day's experience with the apparatus (DOE 1996a).

Physical/Chemical Description of Constituents Released

Laboratory analysis of the liquid indicated that both F001 and F002 waste codes were applicable and therefore, listed hazardous materials were generated during cleanup. Analysis for PCBs indicated less than 2 parts per million (ppm) PCBs, indicating no PCBs were present within the released liquid. The following compounds were identified in the released liquid, Trichloroethene (250 ppm), methylene chloride (33 ppm) and 1,1,1-trichloroethane (930 ppm). No radioactivity was identified (DOE, 1996a).

### Response to Operation or Occurrence

After the first two incidents on October 10, 1996, a plastic bag was placed under and around the exhaust condensate line to collect any residual release. In both instances, the Rocky Flats Fire Department was contacted immediately upon discovery of the liquid. Fire Department personnel performed a thorough cleanup of the liquid using rags (for the asphalt surfaces) and filled less than one 55-gallon drum of soil during the October 11, 1996, release. A fact finding meeting was held to further evaluate the design problem encountered with the tanker and sampling was conducted. The release was categorized and reported as an "incidental release," in accordance with the 29 Code of Federal Regulations 1910.120, Incidental Response. All associated wastes were containerized and managed in accordance with site requirements. The releases (at both locations) were reported in the 1997 Annual Update to the Historical Release Report (HRR) as 700-1114a and 700-1114b for the Building 774 location and the Building 765 location respectively (DOE 1997, Plate 2).

### Fate of Constituents Released to the Environment

Less than one 55-gallon drum of soil and associated cleanup waste assumed to be contaminated with Environmental Protection Agency (EPA) Waste Codes F001 and F002 were removed and transported to a RCRA Hazardous Waste Management Unit. No radiological contamination was found in the area of the release (DOE 1996a).

### Action/No Further Action Recommendation

Based upon the amount of material spilled and cleanup response actions taken by the Fire Department in 1996 at both locations, no potential contaminant source or remnant concentrations exist at either location (700-1114a or 700-1114b). The regulatory agencies agreed to No Further Action (NFA) as proposed in the 1997 HRR Annual Update on February 27, 2002, provided the PAC narrative to be corrected to accurately reflect that the building associated with the first spill was 765 and is designated as 700-1114a. Therefore, in accordance with the Rocky Flats Cleanup Agreement (RFCA) (DOE 1996b) and the joint agency letter of February 14, 2002, PACs 700-1114a and 700-1114b are considered NFA at this time.

### Comments

The incident did not result in any injury or potential hazard to human health or the environment.

During the NFA Status meetings held between October 2001 and April 2002, between K-H, DOE, EPA and the Colorado Department of Public Health and Environment, it was agreed that this PAC Narrative would be rewritten to clarify where and how the specific locations occurred and how they numbered (i.e., 1114a and 1114b). Although the 1997 HRR Annual Update Plate #2 shows where the specific incidents occurred and properly assigned the PAC numbers, the text narrative did not specify the separate location numbers. This PAC Narrative has been rewritten for clarity.

### References

DOE, 1996a, Occurrence Report (RFO-KHLL-LIQWASTE-1996-0004), Rocky Flats  
Environmental Technology Site, Golden, CO, October

DOE, 1996b, Final Rocky Flats Cleanup Agreement, Department of Energy, Rocky Flats  
Environmental Technology Site, Golden, CO, July

RMRS, 1997, Annual Update to the Historical Release Report, August 1996 through August  
1997, Rocky Flats Environmental Technology Site, Golden, CO, September

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**PAC REFERENCE NUMBER: 900-109**

IHSS Reference Number      109, Buffer Zone Operable Unit

Unit Name                      Trench T-2 (Ryans Pit)

Approximate Location      N748,600, E2,085,800

Date(s) of Operation or Occurrence

1969 - 1971

Description of Operation or Occurrence

IHSS 109 (PAC 900-109) is generally referred to as Ryan's Pit and is located south of the 903 Pad (PAC 900-112). The area was primarily used for disposal of solvents, paint thinners, diesel fuel and other construction related chemicals/materials (DOE 1992). Historically, the building operation was to perform radiation screening of the waste and if identified as non-radioactive, the solvents were dumped in the trench as a method of disposal. The trench is referred to as Ryan's Pit after a member of the Waste Disposal Coordination Group who was involved with past solvent disposal (DOE 1996a).

After a review of the information gathered in preparation of the Historical Release Report (DOE 1992), it is believed that Ryan's Pit was not used in the same manner as the East Trenches as indicated in RCRA 3004(u). Based on a review of historical documents, an evaluation of many historical photographs, and interviews with former RFP personnel who were directly involved with plant waste disposal activities, it is probable that Ryan's Pit was used from approximately 1969 to 1971 for the disposal of nonradioactive liquid chemical wastes. Previously, Ryan's Pit was believed to have been used similarly to the East Trenches because of discussion in a 1970 document entitled "A Summary of On Site Radioactive Waste Disposal". An evaluation of aerial and low-angle oblique photographs was made and included the years 1953, 1955, 1957, 1964, 1969, 1970, and 1971. Activities involving on-site burial of sludge from the sanitary wastewater treatment plant occurred from July 1954 through August 1968. These photographs clearly indicate the existence of the East Trenches in various stages of development. Yet none of the photographs from 1953 through 1968 provides any indication of ground disturbances in the area of Ryan's Pit. In 1969 and 1970, there clearly is an open trench in the area south of the 903 Pad and in the general area as located in the 1970 report. In a May 1971, photograph, the trench is backfilled and graded, but still visible (DOE 1996a).

Physical/Chemical Description of Constituents Released

Soils contaminated from the dumping of solvents and other wastes were sampled extensively during the removal action in 1995 and prior to treatment. Analytical results for these samples indicated elevated volatile organic compounds including tetrachloroethene, xylene, toluene,

1,1,1-trichloroethane, trichloroethene, and ethylbenzene Radionuclides in the soil were compared to RFCA Tier I and Tier II Subsurface Soil Action Levels (DOE 1996b) and were all below the RFCA Tier II Action Levels

#### Responses to Operation or Occurrence

Disposal of waste at Ryan's Pit was discontinued in 1971 and the trench was backfilled. The IHSS 109 Accelerated Action Project was initiated in September of 1995 as a source removal in accordance with the Final Proposed Action Memorandum (PAM) approved by the Agencies on August 28, 1995 (DOE 1995a). Approximately 180 cubic yards of contaminated soil and debris (primarily crushed drums) were excavated from IHSS 109 and treated by low temperature thermal desorption to destroy the volatile organic component of contamination in the soil. Treatment of these soils required a CDPHE approved modification to the existing RCRA Part B permit (DOE 1995b). The removal of contaminated soil from Ryan's Pit was completed in September 1995 and treatment completed in February 1996 in accordance with the RAOs set forth in the approved PAM.

#### Fate of Constituents Released to Environment

Solvents that may have been disposed included tetrachloroethene, trichloroethane, and possibly carbon tetrachloride, though not as likely. These were the solvents typically used at the plant during the time frame. Other chemicals which were dumped included paint thinner, diesel fuel (used as a brush softener) and small quantities of construction-related chemicals. RFI/RI investigations for Operable Unit 2 have identified elevated levels of volatile organic compounds (VOCs) in groundwater downgradient from the Ryan's Pit location (DOE 1995c). Sampling of the groundwater downgradient of Ryan's pit continues as part of the Integrated Monitoring Plan (IMP). The Draft 2001 Annual RFCA Groundwater Monitoring Report presents FY2001 groundwater data and proposes continued monitoring along the plume cross section (DOE 2002).

#### Action/No Further Action Recommendation

The excavation verification sample results for the volatile organic contaminants of concern show that the soils remaining in the excavation were below the PPRG cleanup standards specified in the PAM (DOE 1995a) at a depth of eight feet. With respect to RFCA ALs, which were approved after the final putback of Ryan's Pit spoils, there are Tier I exceedances for TCE and PCE in the South Wall. Toluene and ethylbenzene are below Tier I ALs but exceeded Tier II ALs.

Radiological samples showed plutonium-239, americium-241, uranium-233/-234, -235 and -238 at levels above background in the excavated soils, however, these radiological levels were below RFCA Tier II Action Levels and less than the 15 mrem hypothetical future resident scenario, the most restrictive scenario for the future land use of the site (DOE 1996a).

On April 3, 2002, during an NFA Status Meeting, the EPA and CDPHE concurred with the recommendation for NFA submitted in the 1997 Annual Update to the HRR (DOE 1997). The Agencies however requested that the PAC Narrative for PAC 900-109 be amended in this

Annual Update to reflect the fact that contaminants in a nearby down-gradient groundwater monitoring well(s) (specifically well 07391) have not shown evidence of plume degradation. These comments have been incorporated into this narrative and therefore PAC 900-109 is considered NFA as agreed. It is understood that groundwater monitoring will continue as proposed.

### Comments

The post-treatment levels of volatile organic compounds in the treated soils returned to Ryan's Pit (PAC 900-109) were less than the thermal desorption unit performance standards specified in the PAM Permit Modification (DOE 1995b) as documented in the completion report (DOE 1997).

Potential impacts to surface water were evaluated from existing groundwater data. One unnamed seep location near the Woman Creek drainage, that potentially could be related to Ryan's Pit, was sampled in FY2000 and showed PCE concentrations at the Groundwater Tier II AL (actual results were 4 ppb) for VOCs. In accordance with RFCA Attachment 5 (page 5-13), Groundwater Action Determinations, actions are required where there is potential to cause surface water to exceed surface water action levels. In this case, a detection at or just below the Groundwater Tier II Action Level from a seep with nearly zero flow rates could not result in an exceedance of RFCA Surface Water Action Levels.

Analytical results for the verification samples are presented in the completion report for the project (DOE 1997).

### References

DOE, 1992, Historical Release Report for the Rocky Flats Plant, Rocky Flats Plant, Golden, CO, June

DOE, 1995a, Final Proposed Action Memorandum for the Remediation of Individual Hazardous Substance Site 109, Ryan's Pit, Rocky Flats Plant, Golden, CO, August

DOE, 1995b, Proposed Action Memorandum and Draft Modification of the Corrective Action Section for the Operating Permit for the Rocky Flats Environmental Technology Site, Rocky Flats Plant, Golden, CO, November

DOE, 1995c, Final OU 2, Phase II RFI/RI Report, Rocky Flats Plant, Golden, CO, October

DOE, 1996a, Annual Update for the Historical Release Report, August 1, 1995 through August 1, 1996 RF/ER-96-0046 September

DOE, 1996b, Final Rocky Flats Cleanup Agreement, Department of Energy, Rocky Flats Environmental Technology Site, Golden, CO, July

DOE, 1997, Closeout Report for the Remediation of Individual Hazardous Substance Site 109, Ryan's Pit, Revision 0 RF-ER-96-0034 UN, July

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DOE, 2002, Draft 2001 Annual Rocky Flats Cleanup Agreement (RFCA) Groundwater Monitoring Report, Rocky Flats Environmental Technology Site, Golden, CO, September

KH, 1999, Final Technical Memorandum, Monitoring of the 903 Pad/Ryans Pit Plume, RF/RMRS-98-294 UN, Rev 0, May

**PAC REFERENCE NUMBER: 900-183**

IHSS Reference Number 183, Buffer Zone Operable Unit

Unit Name Gas Detoxification Area

Approximate Location N748,500, E2,086,000

Date(s) of Operation or Occurrence

Approximately 1963 - Approximately 1983

Description of Operation or Occurrence

(Original HRR [DOE 1992])

Building 952 was constructed in 1963 as a toxic gas storage building and was managed by the Industrial Hygiene group. Beginning in approximately January 1967, bottles containing hazardous gases were transported by the Rocky Flats Fire Department from various buildings to Building 952 for storage. Typically, shipments consisted of one or two lecture-size gas bottles. Gases were stored up to 5 years prior to disposal. Select gases were detoxified at the site. The method of detoxification was selected based on the characteristics of the material. Other gases were packed and shipped to offsite vendors for disposal (DOE 1992). There are no reports of a release to the surrounding soils from the storage of this material.

Physical/Chemical Description of Constituents Released

No documentation was found that detailed any releases to the building or surrounding soil resulting from this practice (DOE, 1992).

Responses to Operation or Occurrence

Select gases were detoxified using various commercial neutralization processes available at the time. Neutralization processes included reaction with water, acid, caustic, carbon, or air. Byproducts were disposed of as process wastes. Upon completion of the neutralization process for each type of gas, the glassware used in the process was triple-rinsed, crushed, and deposited in the Present Landfill (DOE 1992).

Fate of Constituents Released to Environment

No documentation was found that detailed any release from IHSS 183 (PAC 900-183) (DOE, 1992). This IHSS was studied as part of Operable Unit (OU) 2 (DOE 1995). As presented in the Historical Release Report (HRR) and supporting reference material, past releases from IHSS 183 (PAC 900-183) are not known to have occurred (DOE, 1992). The reference material, which

included records on the movement, storage, and disposal of toxic gases, Industrial Hygiene status reports, and the Resource Conservation and Recovery Act (RCRA) 3004U Waste Management Report, were reevaluated to support the assertion that a release at IHSS 183 has not occurred (DOE 1992)

IHSS 183 was studied as part of the OU 2 FCRA Facility Investigation/Remedial Investigation (RFI/RI) and, for investigative purposes, was grouped with IHSS 140 (PAC 900-140) because of the close proximity of these two IHSSs. Of the nine boreholes located within IHSS 140, one borehole (12791) was located near IHSS 183. Samples were collected and analyzed for volatile organic compounds, semivolatile compounds, pesticides/polychlorinated biphenyls, metals, and radionuclides. Only methylene chloride (2 parts per billion [ppb]) and acetone (15 ppb) were detected in borehole 12791. These chemicals were not retained in the OU 2 RFI/RI or the associated human health risk assessment as chemicals of concern (DOE 1995). With respect to ecological receptors, IHSS 183 was not identified as a source area in the ecological risk assessment for the Woman Creek Watershed (DOE 1996).

#### Action/No Further Action Recommendation

The regulatory agencies provided conditional approval to this request for No Further Action (NFA) in an interim NFA meeting on November 14, 2001 provided that the closure plan correspondence from DOE RFFO to Colorado Department of Public Health and Environment (CDPHE) dated November 9, 1995 be submitted in this Annual Update to the HRR (see below references). The letter has been provided as an attachment for this PAC Narrative update in Appendix 2 (Regulatory Correspondence) and therefore, IHSS 183 (PAC 900-183) is considered accepted as proposed for NFA.

#### Comments

It is recognized that IHSS 183 (PAC 900-183) overlaps with IHSS 155, which will be addressed as a separate action.

In response to comments received from the regulatory agencies on July 9, 1999, this PAC Narrative update was submitted as part of an Interim Update to the HRR in August 2000 (K-H, 2000).

#### References

DOE, 1992, Historical Release Report for the Rocky Flats Plant, Rocky Flats Plant, Golden, CO, June

DOE, 1995, Final Phase I RFI/RI Report 903 Pad, Mound, and East Trenches Area, Operable Unit 2, RF/ER-95-0079 UN, Rocky Flats Environmental Technology Site, Golden, CO, October

DOE, 1995, Correspondence to J S Schieffelin (CDPHE) from K A Klein (DOE RFFO), RE RCRA Permit (91-09-30-01) Modification Request No 45 for expeditious closure of Unit 23, Building 952, November 9 1995

DOE, 1996, Final Phase I RFI/RI Report Woman Creek Priority Drainage, Operable Unit 5, RF/ER-96-0012 UN, Rev 0, Rocky Flats Environmental Technology Site, Golden, CO, April

K-H, 2000, Historical Release Report (Interim Update) and Response to Comments for HRR Annual Updates (1997, 1998 & 1999), Rocky Flats Environmental Technology Site, Golden, CO , August

**PAC REFERENCE NUMBER: UBC SITE 123**

IHSS Number                      Not Applicable

Unit Name                        Building 123 Under Building Contamination

Location                         N749,000, E2,082,000 (Building 123)

Date(s) of Operation or Occurrence

No documentation was found that detailed the dates of occurrence. Building 123 was first occupied in 1953. However, it is believed that leaks of process waste could have occurred from the start of operations up to approximately 1975.

Description of Operation or Occurrence

Building 123 was located on Central Avenue, between Third and Fourth Streets. The original building was constructed in 1953, with additions completed in 1968, 1972, and 1974. Building 123 housed the Site's Radiological Health Physics Laboratory, where water, biological materials, soil, air, and filter samples were analyzed for the presence of plutonium, americium, uranium, alpha, beta, and gamma radiation, tritium, beryllium, and organic constituents. In addition, personnel radiation badges were counted and repaired in Building 123. Radioactive sources, including cesium, were stored in belowgrade concrete pits. Low-level liquid and chemical wastes were generated and transferred to onsite treatment systems via the process waste transfer and collection system (DOE 1992). Portions of Resource Conservation and Recovery Act (RCRA) Unit 40, including sumps and pipes, were part of UBC Site 123. Some of the underground process waste lines associated with Building 123 were abandoned in place and plugged with cement in 1982 (i.e., Original Process Waste Lines [OPWL]), while others remained in active use until laboratory operations were suspended in preparation for facility decommissioning (e.g., New Process Waste Lines [NPWL]). The process waste lines are shown on Figure 2.13.

Building 123 was decommissioned in 1998 in accordance with the Proposed Action Memorandum (PAM) for the decommissioning of Building 123 (RMRS 1998a). At that time, the building structure, along with the aboveground portions of the process waste system, was removed and the floor slab was sampled to assess areas of potential contamination. Contaminated portions of the slab that could not be decontaminated to meet the applicable unrestricted release criteria were encapsulated with epoxy paint to fix removable contamination and covered with steel plate.

In addition, the underground sumps, pipe chases, and process waste lines that ran from Room 156, through Rooms 157 and 158, to Valve Vault 18, were clean-closed in place in accordance with the Closure Plan for the Building 123 Components of RCRA Unit 40 (NPWL PAC 000-504) (RMRS 1997) Partial closure was certified by a Colorado-registered professional engineer on May 28, 1998 (RMRS 1998b) A contaminated sump, located in Room 125, was removed during decommissioning Final disposition of the building slab, underground sumps, process waste lines (including the abandoned lines), and source pits were deferred to the Environmental Restoration (ER) Program

#### Physical/Chemical Description of Constituents Released

Building 123, the Health Physics Laboratory, generated low-level radioactive waste as well as chemical wastes The types of waste consisted of laboratory wastes from analysis of urine, fecal, and other bioassay samples Process wastes reportedly leaked from the OPWL, including nitrate-bearing wastes that may have contained radionuclides Unconfirmed reports of contaminant spills also were indicated in interviews with building employees In the late 1960s or early 1970s, a cesium-contaminated liquid was reportedly spilled on the concrete floor in Room 109 The floor was immediately sealed to immobilize the contamination Room 109 also contained source storage pits Undocumented thorium research was performed in Room 105 Scoping surveys conducted in May through July 1997 revealed elevated levels of radioactivity in both Rooms 105 and 109 In-situ gamma spectroscopic measurements performed in August 1997 indicated the presence of cesium-137 and thallium-232 in Rooms 109 and 105, respectively (RMRS 1998c) Potential contaminants of concern (PCOCs) beneath the slab are uranium, plutonium, cesium, metals, and volatile organic compounds (VOCs) (DOE 2000a)

As described in Industrial Area Sampling and Analysis Plan (IASAP) Addendum #IA-02-01 (DOE 2001b), PCOCs at UBC 123 were determined based on data collected during the characterization of UBC 123, as summarized in the Final Data Summary Report for the Characterization of UBCs 123 and 886 (DOE 2001b), and data collected during previous studies (DOE 2001c, DOE 2000b) These pre-accelerated action data, greater than background plus two standard deviations or method detection limits (MDLs), along with Rocky Flats Cleanup Agreement (RFCA) Tier I and Tier II Action Levels (ALs) are shown on Figures 2 14 and 2 15 Because a sufficient number of samples were collected during previous studies to characterize UBC Site 123, additional characterization was not required Results from previous sampling and analysis of surface and subsurface soil at UBC 123 and IHSS 148 indicated that

- Lead was detected in subsurface soils above the Tier I AL at one location,
- Radionuclides and metals were detected at concentrations above background plus two standard deviations at UBC 123 and IHSS 148,
- An arsenic concentration exceeding the Tier II AL but below background was detected at one location in surface soil,
- A beryllium concentration exceeding the Tier II AL was detected at one location in surface soil, and
- Methylene chloride was detected in subsurface soil at levels slightly above the RFCA Tier II AL

### Responses to Operation or Occurrence

The accelerated action included removal of the Building 123 slab, footers, source pits, manholes, sumps, process waste lines, and contaminated soil, as well as site reclamation. Activities were conducted between January 29 and April 18, 2002. Details are provided in the Draft Closeout Report for IHSS Groups 100-4 and 100-5 (DOE 2002a).

Confirmation sampling and analysis were conducted, after excavation and before backfilling, to verify accelerated action goals. Confirmation sampling results indicate that all contaminant concentrations are less than RFCA Tier II ALs. Figure 2.16 and Table 2.18 present confirmation sampling results that are greater than background plus two standard deviations or MDLs, along with RFCA Tier I and Tier II ALs for reference.

**Table 2.18 Confirmation Sampling Results Greater Than Background Plus Two Standard Deviations or Method Detection Limits**

Location Code	Analyte	Result (pCi/g)	Background Plus Two Standard Deviations (pCi/g)	Tier I AL (pCi/g)	Tier II AL (pCi/g)
BU38-0002	Uranium-238	1.66	1.49	103.00	506.00
BU38-0002	Uranium-238	1.66	1.49	103.00	506.00
BU38-0004	Uranium-235	0.20	0.12	24.00	113.00
	Uranium-238	1.68	1.49	103.00	506.00
BU38-0005	Americium-241	0.05	0.02	38.00	209.00
Central Point on Southern PWL	Uranium-238	1.55	1.49	103.00	506.00

- Tier II values for nonradionuclides represent either 1E+06 carcinogenic risk or a hazard index of 1 for noncarcinogenic toxicity
- Tier II values for radionuclides are based on an annual dose limit of 15 mrem to a hypothetical future resident
- Tier I values for nonradionuclides represent either 1E+04 carcinogenic risk or a hazard index of 1 for noncarcinogenic toxicity
- Tier I values for radionuclides are based on an annual dose limit of 85 mrem to a hypothetical future resident

### RCRA Unit Closure

The pipe chases and sumps in Rooms 156, 157, and 158, shown on Figure 2.17, were closed in accordance with the Closure Plan for Building 123 Components of RCRA Unit 40 (DOE 1997) but were not removed. Closure of the sump in Room 125 and the underground pipe from Room 158 did not meet the closure performance standards (RMRS 1998b) and were deferred to ER remediation. RCRA COCs at this location were metals and radionuclides.

RCRA closure accelerated action objectives were to remove all sumps and process waste lines associated with RCRA Unit 40, shown on Figure 2.17, within the IHSS Group 100-4 Area of Concern (AOC). Sumps located in former Rooms 156, 157, and 158 were removed, along with more than 1 foot of soil around and beneath the sumps. Pipelines between former Rooms 156 and 157 sump locations and more than 1 foot of soil around and beneath the pipelines was excavated. Additionally, approximately 40 feet of associated 4-inch-diameter stainless steel pipeline was excavated. Contamination was not detected on sumps or associated pipeline.

Confirmation samples were collected from the soil beneath each sump location, and one was collected in the pipeline trench between the Room 156 and 157 sump locations. Confirmation sampling locations are BU38-0002, BU38-0003, BU38-0004, BU38-0005, BU38-0006, BU38-0007, BU38-0008 and the Central Point of Southern PWL. Soil samples were analyzed for

radionuclides only because they could be used as an indication of sump or pipeline leaks. If elevated radionuclides were detected, additional analyses for metals would be required. As indicated in Table 2 19, americium-241 was slightly greater than background plus two standard deviations at one location, uranium-235 was slightly greater than background plus two standard deviations at one location, and uranium-238 was slightly greater than background plus two standard deviations at two locations. These data indicate that the sumps and pipelines had not leaked. Results for analytes greater than background plus two standard deviations are shown on Figure 2 16 and summarized in Table 2 19.

RCRA Unit 40 process waste lines were excavated and removed from the sumps to Manhole (MH)-2. The remaining pipeline south of MH-2 to Valve Vault 18 could not be removed because of infrastructure constraints. The location of this pipeline is shown on Figure 2 18. The sump (waste pumping station) in Room 125 was removed during decontamination and decommissioning (D&D) of the building. The following portions of RCRA Unit 40 were removed:

- Sumps in former Rooms 156, 157, and 158 and associated pipelines, and
- Process waste line from the sumps to MH-2

#### Residual Contamination

Accelerated actions for UBC-123 consisted of excavation of OPWL, NPWL, source pits, sumps, one RFCA Tier I lead exceedance, and one RFCA Tier I SVOC SOR exceedance. Residual contamination, consisting of confirmation sampling locations and pre-accelerated action sampling locations that were not remediated at UBC-123 are summarized in Table 2 19 and shown on Figure 2 19. Pipelines that were not removed during the accelerated action are shown on Figure 2 20. Pipeline ends were grouted. Additional removal actions beyond ER RSOP Notification #IA-02-01 accelerated action goals (DOE 2002b) were not required at IHSS 100-4 because of the following:

- Residual radionuclide activities in subsurface soil were less than RFCA Tier II ALs and only slightly greater than background plus two standard deviations,
- Residual lead concentrations in subsurface soil were less than Tier II ALs and only slightly greater than background plus two standard deviations,
- Residual SVOC concentrations were less than Tier II ALs and only slightly greater than MDLs, and the Tier II SOR was less than 1, Radionuclide activities in surface soil were less than Tier II ALs and only slightly greater than background plus two standard deviations (DOE 2002b),
- Beryllium concentration in surface soil, outside of UBC 123, IHSS 148, and PAC 100-611 but within the AOC, at only one location and was 0.16 mg/kg greater than the RFCA Tier II AL, and
- Methylene chloride concentrations in subsurface soil, outside of UBC 123, IHSS 148, and PAC 100-611 but within the AOC, were greater than the RFCA Tier II AL at 6 locations. Methylene chloride does not pose a significant risk at these concentrations. Additionally, methylene chloride was found in laboratory blanks associated with the data set.



**Figure 2.17**  
**UBC 123 RCRA Unit 40**

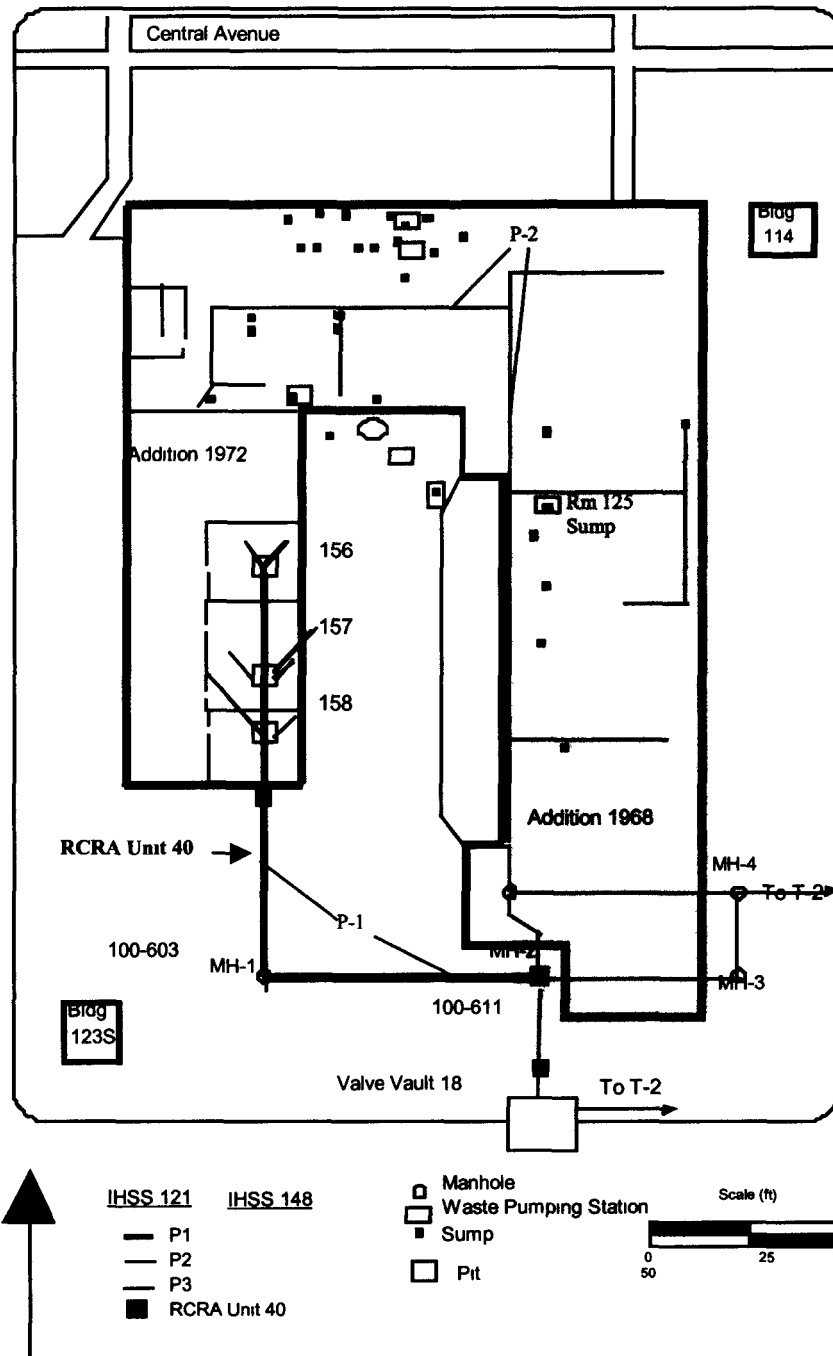


Table 2.19 Residual Contamination at UBC-123

Location	Analyte	Media	Residual Concentration	Units	Background Plus Two Standard Deviations	MDL	Tier I AL (pCi/g)	Tier II AL (pCi/g)
BU38-0005	Americium-241	Subsurface Soil	0 05	pCi/g	0 02	NA	209	38
BU39-0004	Americium-241	Subsurface Soil	0 08	pCi/g	0 02	NA	209	38
Eastern Process Line	Americium-241	Subsurface Soil	0 13	pCi/g	0 02	NA	209	38
Eastern Process Line	Plutonium-239/24	Subsurface Soil	0 06	pCi/g	0 02	NA	1,088	252
Northern Process Line	Plutonium-239/24	Subsurface Soil	0 11	pCi/g	0 02	NA	1,088	252
SS306893	Americium-241	Surface Soil	0 03	pCi/g	0 02	NA	215	38
SS306793	Americium-241	Surface Soil	0 12	pCi/g	0 02	NA	215	38
	Beryllium	Surface Soil	1 20	mg/kg	0 97	NA	104	1
	Cobalt	Surface Soil	28 70	mg/kg	10 91	NA	115,000	115,000
SS307093	Americium-241	Surface Soil	0 03	pCi/g	0 02	NA	215	38
	Copper	Surface Soil	25 10	mg/kg	18 06	NA	71,100	71,100
	Lead	Surface Soil	152 00	mg/kg	54 62	NA	1,000	1,000
	Plutonium-239/240	Surface Soil	0 16	pCi/g	0 02	NA	1,429	252
	Zinc	Surface Soil	113 00	mg/kg	73 76	NA	576,000	576,000
SS307293	Cobalt	Surface Soil	11 30	mg/kg	10 91	NA	115,000	115,000
	Americium-241	Surface Soil	0 05	pCi/g	0 02	NA	215	38
SS307393	Americium-241	Surface Soil	0 03	pCi/g	0 02	NA	215	38
	Copper	Surface Soil	22 70	mg/kg	18 06	NA	71,100	71,100
	Lead	Surface Soil	128 00	mg/kg	54 62	NA	1,000	1,000
	Plutonium-239/240	Surface Soil	0 17	pCi/g	0 02	NA	1429	252
	Zinc	Surface Soil	134 00	mg/kg	73 76	NA	576,000	576,000
SS307593	Americium-241	Surface Soil	0 02	pCi/g	0 02	NA	215	38
	Lead	Surface Soil	165 00	mg/kg	54 62	NA	1,000	1,000
	Zinc	Surface Soil	85 50	mg/kg	73 76	NA	576,000	576,000
SS307693	Americium-241	Surface Soil	0 19	pCi/g	0 02	NA	215	38
	Barium	Surface Soil	203 00	mg/kg	141 26	NA	133,000	133,000
	Copper	Surface Soil	19 80	mg/kg	18 06	NA	71,100	71,100
	Strontium	Surface Soil	94 70	mg/kg	48 94	NA	1,000,000	1,000,000
	Uranium-238	Surface Soil	2 14	pCi/g	2 00	NA	566	103

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Location	Analyte	Media	Residual Concentration	Units	Background Plus Two Standard Deviations	MDL	Tier I AL (pCi/g)	Tier II AL (pCi/g)
	Zinc	Surface Soil	133.00	mg/kg	73.76	NA	576,000	576,000
HDD-2-07	Acetone	Subsurface Soil	23	µg/kg	NA	13	27,200,000	272,000
	Methylene Chloride	Subsurface Soil	25	µg/kg	NA	6	578	6
	bis(2-Ethylhexyl)phthalate	Subsurface Soil	1200	µg/kg	NA	340	311,000,000	3,110,000
	Copper, Total	Subsurface Soil	182	µg/kg	38.21	0.10	71,100	71,100
1	Methylene Chloride	Subsurface Soil	7.00	µg/kg	NA	6	578	6
11	Acetone	Subsurface Soil	30.00	µg/kg	NA	13	27,200,000	272,000
	Naphthalene	Subsurface Soil	13.00	µg/kg	NA	11	10,100,000	101,000
12	1,2,4-Trichlorobenzene	Subsurface Soil	6.00	µg/kg	NA	5	433,000	4,330
	Acetone	Subsurface Soil	69.00	µg/kg	NA	5	27,200,000	272,000
	Bis(2-Ethylhexyl)phthalate	Subsurface Soil	50.00	µg/kg	NA	10	311,000,000	3,110,000
	Methylene Chloride	Subsurface Soil	34.00	µg/kg	NA	5	578	6
	Naphthalene	Subsurface Soil	13.00	µg/kg	NA	11	10,100,000	101,000
	Uranium-235	Subsurface Soil	0.20	pCi/g	0.12	NA	135	24
13	Carbon Tetrachloride	Subsurface Soil	11.00	µg/kg	NA	6	3,560	36
	Methylene Chloride	Subsurface Soil	34.00	µg/kg	NA	5	578	6
	Naphthalene	Subsurface Soil	16.00	µg/kg	NA	11	10,100,000	101,000
16	Acetone	Subsurface Soil	6.00	µg/kg	NA	5	27,200,000	272,000
	Benzo(a)pyrene	Subsurface Soil	760.00	µg/kg	NA	730	701,000	7,010
	Fluoranthene	Subsurface Soil	1500.00	µg/kg	NA	730	537,000,000	5,370,000
	Pyrene	Subsurface Soil	1300.00	µg/kg	NA	730	397,000,000	3,970,000
17	Acetone	Subsurface Soil	8.00	µg/kg	NA	6	27,200,000	272,000
	Plutonium-239/240	Subsurface Soil	0.03	pCi/g	0.02	NA	1,429	252
18	Acetone	Subsurface Soil	18.00	µg/kg	NA	5	27,200,000	272,000
	Fluoranthene	Subsurface Soil	1200.00	µg/kg	NA	710	537,000,000	5,370,000
	Naphthalene	Subsurface Soil	10.00	µg/kg	NA	5	10,100,000	101,000
	Plutonium-239/240	Subsurface Soil	0.09	pCi/g	0.02	NA	1,429	252
	Pyrene	Subsurface Soil	1100.00	µg/kg	NA	710	397,000,000	3,970,000
19	Naphthalene	Subsurface Soil	10.00	µg/kg	NA	5	10,100,000	101,000

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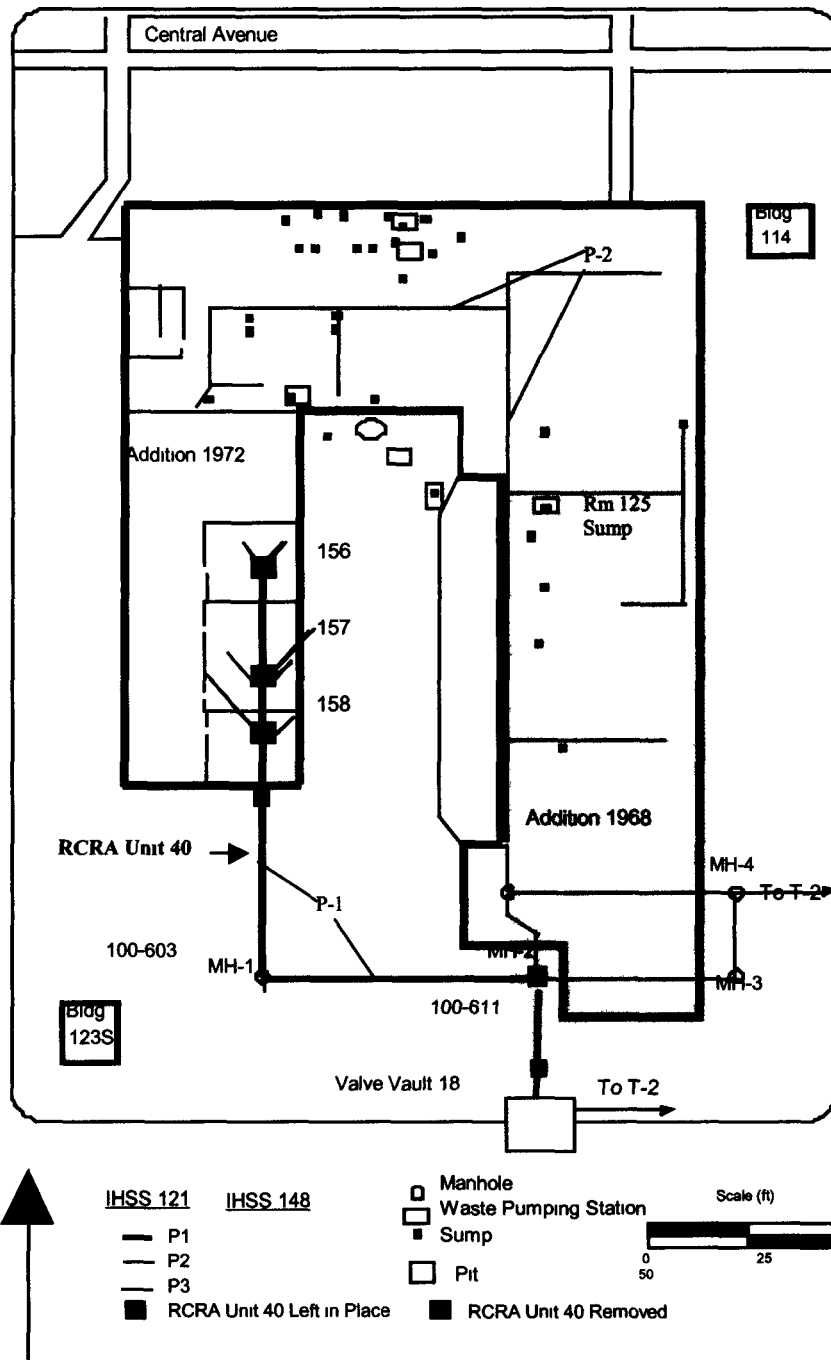
Kaiser-Hill Company, L L C  
Annual Update for the Historical Release Report

KH-01-902 UN  
Rev 0  
Date 09/02

Location	Analyte	Media	Residual Concentration	Units	Background Plus Two Standard Deviations	MDL	Tier I AL (pCi/g)	Tier II AL (pCi/g)
20	Acetone	Subsurface Soil	99 00	µg/kg	NA	6	27,200,000	272,000
21	Plutonium-239/240	Subsurface Soil	0 13	pCi/g	0 02	NA	1,429	252
22	Americium-241	Subsurface Soil	0 10	pCi/g	0 02	NA	215	38
3	Americium-241	Subsurface Soil	0 10	pCi/g	0 02	NA	215	38
	Fluoranthene	Subsurface Soil	410 00	µg/kg	NA	360	537,000,000	5,370,000
	Pyrene	Subsurface Soil	420 00	µg/kg	NA	360	397,000,000	3,970,000
4	Fluoranthene	Subsurface Soil	480 00	µg/kg	NA	350	537,000,000	5,370,000
	Pyrene	Subsurface Soil	540 00	µg/kg	NA	350	397,000,000	3,970,000
8	Fluoranthene	Subsurface Soil	810 00	µg/kg	NA	370	537,000,000	5,370,000
	Pyrene	Subsurface Soil	740 00	µg/kg	NA	370	397,000,000	3,970,000
HDD-2-01	Methylene Chloride	Subsurface Soil	29 00	µg/kg	NA	6	578	6

- Tier II values for nonradionuclides represent either 1E+06 carcinogenic risk or a hazard index of 1 for noncarcinogenic toxicity
- Tier II values for radionuclides are based on an annual dose limit of 15 mrem to a hypothetical future resident
- Tier I values for nonradionuclides represent either 1E+04 carcinogenic risk or a hazard index of 1 for noncarcinogenic toxicity
- Tier I values for radionuclides are based on an annual dose limit of 85 mrem to a hypothetical future resident

**Figure 2.18**  
**RCRA Unit 40 Pipeline Removed and Left in Place**



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### Site Reclamation

All excavated areas were backfilled and revegetated after confirmation sampling results were received and discussed with regulatory agencies through the consultative process. Excavated soil with radionuclide concentrations less than RFCA Tier II ALs was used as backfill in the trench that it was removed from. Additionally, 32 end-dump loads of topsoil from offsite sources were used to bring excavated areas up to grade.

The UBC-123 project area was rough graded before the topsoil was distributed over the site. The topsoil was graded, then scarified, and a seed mix consisting of Canada bluegrass was spread over the site using broadcast seeding methods. Hydromulch was applied to conserve moisture and prevent seed erosion.

### Fate of Constituents Released to Environment

Sumps and process waste lines within UBC 123 were excavated and packaged for disposal. Confirmation sampling results for the soil beneath the sumps and process waste lines indicated all contaminant concentrations were less than RFCA Tier II ALs. Therefore, there is no actual or potential risk to human health or the environment.

### Action/No Further Action Recommendation

Based upon characterization sample results collected in accordance with the IASAP Addendum #IA-02-01 (DOE 2001b), no potential contaminant or residual contaminant source could be identified. Residual analytical soil concentrations for COCs are shown on Table 2.19 as well as Figure 2.19 (UBC 123). Therefore, in accordance with RFCA (DOE 1996) UBC 123 is proposed for No Further Action at this time.

### Comments

None

### References

DOE, 1992, Historical Release Report for the Rocky Flats Plant, Golden, CO, September

DOE, 1997, Closure Plan for Building 123 Components of RCRA Unit 40, Rocky Flats Environmental Technology Site, Golden, CO

DOE, 2000a, Final Sampling and Analysis Plan for the Characterization of Under Building Contamination for UBC 123 and Building 886 Implementing Horizontal Directional Drilling and Environmental Measurement While Drilling, Rocky Flats Environmental Technology Site, Golden, Colorado, May

DOE, 2000b, Industrial Area Data Summary Report, Rocky Flats Environmental Technology Site, Golden, CO, September

DOE, 2001a, Industrial Area Sampling and Analysis Plan Addendum #IA-02-01, Rocky Flats Environmental Technology Site, Golden, CO, November

DOE, 2001b, Final Data Summary Report for the Characterization of UBCs 123 and 886, Rocky Flats Environmental Technology Site, Golden, CO, September

DOE, 2001c, Industrial Area Sampling and Analysis Plan, Rocky Flats Environmental Technology Site, Golden, CO, June

DOE, 2002a, Draft Closeout Report for IHSS Groups 100-4 and 100-5, Rocky Flats Environmental Technology Site, Golden, CO, July

DOE, 2002b, Environmental Restoration RFCA Standard Operating Protocol Notification #02-01, Rocky Flats Environmental Technology Site, Golden, CO, January

RMRS, 1997, Closure Plan for the Building 123 Components of RCRA Unit 40, Rocky Flats Environmental Technology Site, Golden, CO, November

RMRS, 1998a, Proposed Action Memorandum for the Decommissioning of Building 123, RF/RMRS-97-012, Rocky Flats Environmental Technology Site, Golden, CO, March

RMRS, 1998b, Closure Certification for the Building 123 Components of RCRA Unit 40, Rocky Flats Environmental Technology Site, Golden, CO, May

RMRS, 1998c, Final Close-Out Report, Building 123 Decommissioning Project RF/RMRS-98-253 UN, Rev 0, Rocky Flats Environmental Technology Site, Golden, CO September

**PAC REFERENCE NUMBER: UBC 125**

IHSS Number                      Not Applicable

Unit Name                        Building 125 UBC

Approximate Location            N748,990, E2,081,475

Date(s) of Operation or Occurrence

In Service Date 1963 - 2002

Description of Operation or Occurrence

Building 125 housed the Standards Laboratories, as well as offices for Metrology management personnel. The Standards Laboratories provided analytical standards for the onsite laboratories and provided calibration and maintenance of metrology standards for Measurement and Test Equipment (M&TE) used at the Site. After calibration, M&TE was returned to the appropriate user groups.

The only Resource Conservation and Recovery Act (RCRA)-regulated hazardous waste routinely produced in Building 125 consisted of lithium, nickel cadmium, and mercury batteries, which were generated in the electrical calibration process and accumulated in a 90-day collection area. In addition, used fluorescent bulbs, incandescent bulbs, and lead-acid batteries were accumulated. Fluorescent bulbs and incandescent bulbs were removed by utilities and maintenance workers and taken to an approved 90-day collection area. Lead-acid batteries were collected and sent to Waste Operations Property Utilization and Disposal PU&D for recycling. Infrequent, nonroutine RCRA hazardous wastes that were produced included waste mercury and wipes contaminated with mercury (from the Vacuum, Moisture, and Pressure Laboratories), and waste Freon generated by cleaning the inside of pressure gages (from the Pressure Laboratory).

A number of nonhazardous wastes were generated in the building. These included office and laboratory trash, waste gloves, and wipes used to clean dirt and lubricants from M&TE. Wipes contaminated with equipment lubricant were generated on a nonroutine basis. Antifreeze was used in a humidity controller that required replacement every 1 or 2 years. Waste filters were produced during maintenance of the building's domestic water supply and heating, ventilating, and air conditioning systems. Sediment occasionally accumulated in the cooling tower located on the western exterior side of the building and required periodic cleanout by Maintenance personnel.

Ethyl alcohol was used for cleaning M&TE in processes where the solvents were allowed to evaporate to the atmosphere. The limited use of these solvents was required when precision surfaces had to be residue- and corrosion-free. Because the solvents would evaporate in the cleaning process, no RCRA-regulated waste was produced.



Compressed gases used by the Standards Laboratories contained Zero Grade compressed air or atmospheric gases, either in pure form or mixed in various ratios. Depending on the application, the gases were either incorporated into gas standards or released to the atmosphere. Depleted compressed gas cylinders were managed by the Logistics group in Building 552 and did not constitute a waste stream for Building 125.

#### Physical/Chemical Description of Constituents Released

During the Historical Site Assessment (HSA) process for the decontamination and decommissioning (D&D) of Building 125, several individuals who worked in the facility over the past 10 to 15 years were interviewed. They were asked what they knew and/or were told of historical releases in and around the building. The interviews concluded that several small mercury spills occurred within Building 125 and were all less than one-half of the reportable quantity (RQ) of 1 pound. Interviews were once again conducted with site personnel in preparation for the Reconnaissance-Level Characterization Report (RLCR), Group 10 Cluster D&D project. There was noted corroboration between the two separate interview sets regarding these mercury spills.

#### Responses to Operation or Occurrence

The mercury releases were localized in the vicinity of the work areas and controlled by the workers until a thorough, visually inspected cleanup was performed. In some instances, the Fire Department was called to assist with the cleanup. In several cases, the releases did not make it to the floor (i.e., mercury was released in cabinets or on countertops). On one occasion, mercury was released to the concrete slab on the South dock. During this incident, the mercury was immediately controlled and remediated by the Fire Department. All of the releases were cleaned up to the point that residual mercury was not visible, and at most was detectable by a mercury vapor analyzer. Further, the response to and cleanup of these releases was immediate (within 2 hours) and, for this reason, no intrusive sampling of the concrete was specified for the Group 10, Type 1 Facility RLCR.

During reconnaissance sampling in support of the RLCR, it was decided to use a Jerome Model 431 Mercury Vapor Analyzer (Serial #431-1710, last calibrated on May 29, 2001) to analyze for potential residual mercury vapors (in the parts per billion [ppb] range) from the areas identified during the interviews as having had a mercury release. The instrument was zeroed and operated per instructions. Readings at exact locations of known mercury releases were zero milligram per cubic meter (0.000 mg/m<sup>3</sup>, where 1 mg/m<sup>3</sup> Mercury vapor equals 0.122 ppm). The readings obtained above zero (0.000 mg/m<sup>3</sup>) were at or near the instrument's sensitivity limit of 0.003 mg/m<sup>3</sup>, and those readings were only accurate to +/-5% (based upon 0.100 mg/m<sup>3</sup>). Thus, all readings were essentially zero.

#### Fate of Constituents Released to Environment

With regard to the releases of mercury within Building 125, the chemical and physical properties of mercury indicate it would not likely migrate beyond the tile seams, which are in very good

condition and do not appear to have been compromised. In the unlikely event that mercury may have migrated through the tile flooring, it would have to penetrate the underlying mastic before reaching the concrete slab. Because mercury does not absorb into concrete, nor does it cut or penetrate concrete media, the potential for UBC at Building 125 is remote. In addition, there are no other known releases or hazardous spills associated with Building 125 and no original or new process waste lines associated with the facility.

#### Action/No Further Action Recommendation

In accordance with Rocky Flats Cleanup Agreement (RFCA) Attachment 6 (DOE, 1996), UBC 125 was recommended for No Further Action (NFA). The mercury spills discussed in this narrative are what created the UBC potential for the building in the Historical Release Report (HRR) process (DOE 1992). The mercury spills were cleaned up and no other potential source(s) of contamination can be identified. Upon acceptance of this NFA (refer State HR #33 in Appendix 1), Building 125 was demolished.

#### Comments

UBC 125 was initially identified in the original HRR (DOE 1992).

Building 125 was demolished under the D&D Program in Fiscal Year 2002. Sampling and monitoring were conducted within Building 125 in accordance with the RLCP contained in the Decontamination and Decommissioning Characterization Protocol (DDCP, MAN-077-DDCP). A detailed sampling package and report for the Building 125 Cluster was completed and submitted to the regulatory agencies and the Administrative Record (AR). The Agencies concurred with the NFA designation on April 2, 2002 and the building was demolished in September of 2002.

#### References

DOE, 1992, Historical Release Report for the Rocky Flats Plant, Rocky Flats Plant, Golden, CO, June

DOE, 1996, Final Rocky Flats Cleanup Agreement, Department of Energy, Rocky Flats Environmental Technology Site, Golden, CO, July

KH, 2001, Reconnaissance Level Characterization Packages (RLCP) for the Building 125 Cluster, Rocky Flats Environmental Technology Site, Golden, CO, September

**PAC REFERENCE NUMBER: UBC 889**

IHSS Number                      Not Applicable

Unit Name                        Building 889 UBC, including Tank 28

Location                         N749,000, E2,084,000 (Building 889)

Date(s) of Operation or Occurrence

1969 to the late 1980s

Description of Operation or Occurrence

Building 889 was placed into service in 1969. Building 889 housed decontamination and waste reduction operations for wastes originating outside the Protected Area (PA). Wastes entering Building 889 included surplus equipment that would be decontaminated by steam cleaning for reuse onsite or sale offsite. High-efficiency particulate air (HEPA) filters, combustible wastes, and non-reusable equipment were compacted, placed in crates, and shipped offsite for disposal.

Building 889 contained two concrete sumps within the concrete slab. The sumps were designated as Tank 28 and were connected to the Original Process Waste Lines (OPWL), which ran to Tank 40 (refer to PAC 000-121, Tank 40 Narrative in this document).

Physical/Chemical Description of Constituents Released

As described in Industrial Area Sampling and Analysis Plan (IASAP) Addendum #IA-02-01 (DOE 2001), potential contaminants of concern (PCOCs) at UBC 889 were determined based on process knowledge, and included uranium, metals, volatile organic compounds (VOCs), and semivolatile organic compounds (SVOCs). No historical data could be found for UBC 889.

Responses to Operation or Occurrence

The accelerated action included removal of the Building 889 slab, footer walls, footers, sumps, tanks, and waste lines, as well as site grading and vegetation. The two Tank 28 sumps were removed. Activities were conducted between April 19 and July 18, 2002. Details are provided in the Draft Closeout Report for IHSS Group 800-6 (DOE 2002).

Soil samples were collected and analyzed after the building slab, foundation, sumps, tanks and waste lines had been removed. Sampling locations are shown on Figure 2.21. Tables 2.20 and 2.21 summarize sampling results for subsurface and surface soil, respectively, associated with Building 889. The summary includes results associated with the two Tank 28 sumps, because they were located within the Building 889 footprint. Table 2.22 summarizes sampling results for subsurface soil associated with just the two Tank 28 sumps. No surface soil samples associated with Tank 28 could be collected. As indicated in all three tables, no contaminant concentrations exceeded Rocky Flats Cleanup Agreement (RFCA) Tier II action levels (ALs).

#### Fate of Constituents Released to Environment

Slabs, footer walls, footers, sumps, tanks, and waste lines within UBC 889 were excavated and packaged for disposal. Sampling results from the soil beneath the removed items indicated that all contaminant concentrations were less than RFCA Tier II ALs. Therefore, there is no actual or potential risk to human health or the environment.

#### Action/No Further Action Recommendation

Based on the actions taken and sampling results, no further action is justified. Soil concentrations are below RFCA Tier II ALs.

#### Comments

None

Table 2.20 UBC 889 Subsurface Soil Sampling Summary Statistics

Analyte Name	Total Samples Collected	Total Samples > Bkgd or RL	Maximum Result	Tier I AL	Tier II AL	Bkgd Level	Unit
1,2,4-Trichlorobenzene	24	2	6.6	433,000	4,330	NA	ug/kg
1,2-Dichloropropane	12	1	2.2	1,130	11.3	NA	ug/kg
2-Butanone	12	1	10			NA	ug/kg
4-Methyl-2-Pentanone	12	1	5.5			NA	ug/kg
Acetone	12	7	820	27,200,000	272,000	NA	ug/kg
Benzo(a)anthracene	12	2	77	160,000	1600	NA	ug/kg
Bis(2-ethylhexyl)phthalate	12	4	1,100	311,000,000	3,110,000	NA	ug/kg
Calcium	12	4	291,000			39,382.27	mg/kg
Carbon disulfide	12	1	3.4	988,000	9,880	NA	ug/kg
Chromium	12	1	88.1	44,300	4,410	68.27	mg/kg
Chrysene	12	2	93	16,000,000	160,000	NA	ug/kg
Copper	12	4	69.2	71,100	71,100	38.21	mg/kg
Fluoranthene	12	2	160	537,000,000	5,370,000	NA	ug/kg
Magnesium	12	3	12,000			9,315.44	mg/kg
Mercury	12	1	4.9	576	576	1.52	mg/kg
Methylene chloride	12	1	1.1	578	5.78	NA	ug/kg
Naphthalene	24	3	530	10,100,000	101,000	NA	ug/kg
Phenanthrene	12	3	120			NA	ug/kg
Phenol	12	1	160	3,750,000	37,500	NA	ug/kg
Pyrene	12	3	160	397,000,000	3,970,000	NA	ug/kg
Sodium	12	4	3,180			1,251.24	mg/kg
Strontium	12	2	268	1,000,000	1,000,000	211.38	mg/kg
Tetrachloroethene	12	5	2.7	3,150	31.5	NA	ug/kg
Toluene	12	1	0.94	707,000	7,070	NA	ug/kg
Uranium-235	12	8	0.308	113	24	0.12	pCi/g
Uranium-238	12	7	5.3	506	103	1.49	pCi/g
Vanadium	12	1	90.8	13,400	13,400	88.49	mg/kg
Xylenes (total)	12	1	82	9,740,000	97,400	NA	ug/kg

\* Tier II values for nonradionuclides represent either 1E-06 carcinogenic risk or a hazard index of 1 for noncarcinogenic toxicity  
 \* Tier II values for radionuclides are based on an annual dose limit of 15 mrem to a hypothetical future resident  
 \* Tier I values for nonradionuclides represent either 1E-04 carcinogenic risk or a hazard index of 1 for noncarcinogenic toxicity  
 \* Tier I values for radionuclides are based on an annual dose limit of 95 mrem to a hypothetical future resident

Bkgd - background  
 RL - reporting limit

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**Table 2.21 UBC 889 Surface Soil Sampling Summary Statistics**

Analyte Name	Total Samples Collected	Total Samples Greater Than Bkgrd or RL	Maximum Result	Tier I Action Level	Tier II Action Level	Bkgrd Level	Unit
Barium	5	1	194	133,000	133,000	141 26	mg/kg
Calcium	5	5	39,400			4,467	mg/kg
Chromium	5	3	20 1	44,300	4,410	16 99	mg/kg
Cobalt	5	1	11 4	115,000	115,000	10 91	mg/kg
Copper	5	3	73	71,100	71,100	18 06	mg/kg
Iron	5	3	31,300	576,000	576,000	18,037	mg/kg
Magnesium	5	4	11,400			2,849 3	mg/kg
Manganese	5	4	803	83,600	83,600	365 08	mg/kg
Nickel	5	4	24 6	38,400	38,400	14 91	mg/kg
Sodium	5	5	2,450			91 84	mg/kg
Strontium	5	5	131	1,000,000	1,000,000	48 94	mg/kg
Vanadium	5	3	76 9	13,400	13,400	45 59	mg/kg
Zinc	5	1	391	576,000	576,000	73 76	mg/kg

Bkgrd – background

RL – reporting limit

- Tier II values for nonradionuclides represent either 1E+06 carcinogenic risk or a hazard index of 1 for noncarcinogenic toxicity
- Tier II values for radionuclides are based on an annual dose limit of 15 mrem to a hypothetical future resident
- Tier I values for nonradionuclides represent either 1E+04 carcinogenic risk or a hazard index of 1 for noncarcinogenic toxicity
- Tier I values for radionuclides are based on an annual dose limit of 85 mrem to a hypothetical future resident

**Table 2.22 Tank 28 Subsurface Soil Sampling Summary Statistics**

Analyte Name	Total Samples Collected	Total Samples Greater Than Bkgrd or RL	Maximum Result	Tier I Action Level	Tier II Action Level	Bkgrd Level	Result Unit
1,2,4-Trichlorobenzene	10	1	6 6	433,000	4,330	NA	ug/kg
1,2-Dichloropropane	5	1	2 2	1,130	11 3	NA	ug/kg
4-Methyl-2-Pentanone	5	1	5 5			NA	ug/kg
Acetone	5	4	820	27,200,000	272,000	NA	ug/kg
Bis(2-ethylhexyl)phthalate	5	2	160	311,000,000	3,110,000	NA	ug/kg
Calcium	5	3	291,000			39,382 27	mg/kg
Carbon disulfide	5	1	3 4	988,000	9,880	NA	ug/kg
Naphthalene	10	2	530	10,100,000	101,000	NA	ug/kg
Phenol	5	1	160	3,750,000	37,500	NA	ug/kg
Strontium	5	2	268	1,000,000	1,000,000	211 38	mg/kg
Tetrachloroethene	5	3	2 7	3,150	31 5	NA	ug/kg
Uranium-235	5	5	0 308	113	24	0 12	pCi/g
Uranium-238	5	4	5 3	506	103	1 49	pCi/g
Xylenes (total)	5	1	82	9,740,000	97,400	NA	ug/kg

Bkgrd – background

RL – reporting limit

- Tier II values for nonradionuclides represent either 1E+06 carcinogenic risk or a hazard index of 1 for noncarcinogenic toxicity
- Tier II values for radionuclides are based on an annual dose limit of 15 mrem to a hypothetical future resident
- Tier I values for nonradionuclides represent either 1E+04 carcinogenic risk or a hazard index of 1 for noncarcinogenic toxicity
- Tier I values for radionuclides are based on an annual dose limit of 85 mrem to a hypothetical future resident

References

DOE 2001b, Industrial Area Sampling and Analysis Plan Addendum #IA-02-01, Rocky Flats Environmental Technology Site, Golden, CO, November

DOE, 2002, Draft Closeout Report for IHSS Group 800-6, Rocky Flats Environmental Technology Site, Golden, CO, September



## **SECTION 3.0 OTHER SIGNIFICANT EVENTS (TO DATE)**

### 3 0 INTRODUCTION

Section 3 describes specific events, occurrences, and projects that have taken place during the reporting period for this Annual Update. The event descriptions are brief summaries and may be useful for future projects and support of the Site's closure.

#### 3 1 CDPHE Buffer Zone Contamination Report (BZCR)

The 2001 Annual Update to the Historical Release Report (DOE 2001a) documented the final agreements made regarding 15 remaining areas identified by the CDPHE Buffer Zone Contamination Report (BZCR) as being of potential environmental concern. At a January 10, 2002 meeting, agreements were reached to resolve concerns for the remaining BZCR sites identified by CDPHE.

This summary provides the BZCR site status. Except for Site 2 (Lindsay Ranch), the sites requiring further action have been sampled in accordance with an approved Sampling and Analysis Approach (K-H 2002a). Table 3 1 lists the BZCR locations and specific sampling requirements which were agreed to during several meetings with the regulatory agencies.

Analytical results from this investigation are currently being evaluated and compared to RFCA ALs in accordance with RFCA Attachment 5 (DOE, et al 1996). Miscellaneous debris from the Plant security force exercises at the Lindsay Ranch (BZCR Site 2) was cleaned up on August 20, 2002. Further action, including sampling, at this site is not warranted based upon prior agreements made with the regulatory agencies.

With respect to analytical data from sampling activities at other BZCR sites, only Site 31 (Figure 3 1) has undergone the RFCA AL comparison (Figure 3 2). There were no RFCA Tier II AL exceedances at this location as shown on Figure 3. It should be noted that BZCR Site 31 overlaps with PAC 300-700 (see Plate 2). The regulatory agencies concurred NFA for PAC 300-700 on February 14, 2002 (see Appendix 1). Final data assessment of the remaining BZCR Sites listed in Table 3 1 will be dispositioned with the regulatory agencies upon final review of the data and comparison to RFCA ALs.

**Table 3.1 Buffer Zone Contamination Report Locations**

Site ID	Sampling Method	Depth	Number of Sampling Locations	PCOC Parameters	Comments
BZCR Site 2	NA	NA	NA	NA	Debris from the Plant security exercises at the Lindsay Ranch site will be picked up
BZCR Site 6a	Surface Grab	0" – 6"	3	Metals (total) Gamma Spec	Photo 3
BZCR Site 6b	Surface Grab	0" – 6"	5	Metals (total) Gamma Spec	Photo 3 (Note This site will be investigated under the BZSAP for IHSS 216 3)
BZCR Site 7	Surface Grab	0" – 6"	5	Metals (total) Gamma Spec	Photo 6
BZCR Site 8	Surface/Subsurface Geoprobe or Hand Auger	0" – 6'	5	Metals (total) Gamma Spec	Photo 6 (2 foot composites)
BZCR Site 9	Surface Grab	0" – 6"	5	Metals (total) Gamma Spec PCBs	Photo 10 (Note overlap of Sites 7 and 8)
BZCR Site 12	Surface Grab	0" – 6"	5	Metals (total) VOCs PCBs Gamma Spec	Photo 3
BZCR Site 14	Surface Grab	0" – 6"	5	Metals (total) Gamma Spec	Photo 4
BZCR Site 16	Surface Grab	0" – 6"	5	Metals (total) Gamma Spec	
BZCR Site 19	Surface Grab	0" – 6"	3	Metals (total) Gamma Spec	Photo 8
BZCR Site 28	Surface Grab	0" – 6"	5	Metals (total) Gamma Spec	Sediment in drainage (Photo 8)
BZCR Site 31	Geoprobe	0" – 15'	3	Metals (total) Gamma Spec	Photo 2 (Depth integrated 5 foot composite)
BZCR Site 32	Surface Grab	0" – 6"	5	Metals (total) Gamma Spec	Multiple photos
BZCR Site 33a	Surface Grab	0" – 6"	3	Metals (total) Gamma Spec	Multiple photos
BZCR Site 33b	Surface Grab	0" – 6"	3	Metals (total) Gamma Spec	Multiple photos

Total metals by SW846 Method 6010  
Total VOCs by SW846 Method 8260  
PCBs by SW846 Method 8082

**Table 3.2 Analytical Data for BZCR Site 31**

Analyte Name	Total Samples Collected	Maximum Result	Units	Tier I (mg/kg)	Tier II (mg/kg)	Mean Plus Two Standard Deviations
<b>Subsurface Soil</b>						
Cadmium	25	1 8	mg/kg	1,920	1,920	1 7
Chromium	25	91 5	mg/kg	44,300	4,410	68 27
Lead	25	38 6	mg/kg	1,000	1,000	24 97
Uranium-235	26	0 298	pCi/g	113	24	0 12
Uranium-238	26	3 88	pCi/g	506	103	1 49
<b>Surface Soil</b>						
Uranium-235	3	0 231	pCi/g	135	24	0 0939
Uranium-238	3	2 27	pCi/g	586	103	2
Copper	3	21 2	mg/kg	71,100	71,100	7

### 3 2 Operable Unit 1-IHSS 119 1 (July 31, 2001)

A major Modification to the OU 1 CAD/ROD (DOE 2001b) was submitted to EPA and CDPHE for approval in January 2001 for a modification to the selected remedy for IHSS 119 1 as identified in the original OU 1 CAD/ROD (DOE 1997). The Modification included continuation of groundwater extraction and treatment from the OU 1 collection well for a period of 1 year after signing the CAD/ROD Modification, and groundwater monitoring at IHSS 119 1 consistent with the RFETS Integrated Monitoring Program (IMP). The major Modification was signed by the regulatory agencies in February 2001.

The collection well was sampled quarterly. Table 3 3 shows monthly volumes of water treated for the period of January through December 2001. VOC analytes above detection limits from the four 2001 samples are reported in Table 3 4. Figure 3 2 shows the behavior of trichloroethene (TCE) concentrations relative to time. This graph is the updated version of the graph in the OU 1 CAD/ROD Modification. There was a small spike in TCE concentrations in the September sample, however, concentrations did not exceed Tier I ALs. Based on historical data, this increase in concentration is likely attributable to dry conditions, is an anomalous laboratory result, or could be an outlier.

**Table 3.3 Volume of Groundwater Collected From the OU 1 Collection Wells**

Month (in 2001)	Volume of Water Collected (gallons)
January	1,010
February	780
March	645
April	745
May	750
June	1,330
July	970
August	940
September	695
October	705
November	645
December	410
Total	9,625

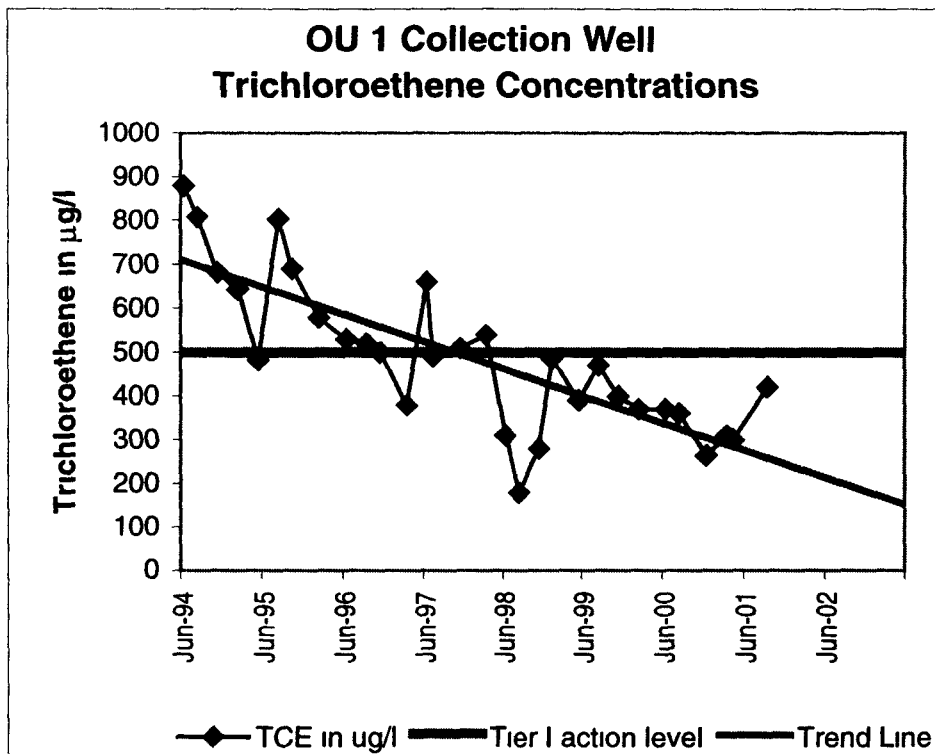
**Table 3.4 OU 1 Collection Well Analytical Results for 2001 Sampling Events**

Analyte	Concentration (µg/l)	RFCA Groundwater Tier II Action Levels (µg/l)
1,1,2-Trichlorotrifluoroethane	ND - 3 J	NA
1,1-Dichloroethene	10 JD - 23	7
1,1,1-Trichloroethane	ND - 3 J	200
Carbon tetrachloride	10 J - 20 J	5
Chloroform	ND - 1 J	100
Methylene chloride	ND - 81 BD	5
Tetrachloroethene	28 - 33	5
Trichloroethene	300 - 420	5

D = Diluted Sample

J = Detected at concentrations below the detection limit for this analysis

**Figure 3.2 Trichloroethene Concentrations Relative to Time**



Per the CAD/ROD Modification and based on the analytical data, beginning in April 2002, water from the collection well is no longer being collected. This is consistent with the modified CAD/ROD, which states that the collection well will be operated for 1 year after the signing of the final Modification (DOE 2001b). Also per the modified CAD/ROD, monitoring of the collection well will continue in order to verify that levels stay below RFCA Tier I ALs.

### 3.3 IHSSs SW-115 and SW-196 – The Original Landfill

The RFI/RI for the Original Landfill (OLF), issued in 1996, indicated that the site posed negligible risk to human health or the environment. As a lower-priority site, the OLF received little attention until recently under a RFCA Interim Measure/Interim Remedial Action (IM/IRA) Decision Document to assess remediation alternatives. In the process of clarifying the objectives of the accelerated action, it became evident that stabilizing the hillside slope would be a priority of any option that leaves the waste fill in its current location. These alternatives included:

- 1 No further action,
- 2 Slope stabilization by regrading and installing a groundwater diversion system and cover,
- 3 Slope stabilization by installing buttress walls and installing a groundwater diversion system, and cover, and
- 4 Excavation and disposal (with options for both offsite and on-site disposal)

Most alternatives are complicated by the Preble's meadow jumping mouse (PMJM) Protection Area, which extends well into the OLF and requires that construction be phased and scheduled to avoid or minimize ecological impacts. Jurisdictional wetlands are found within the OLF boundaries. After extensive discussion and consideration, an approach was accepted by CDPHE, EPA, and the USFWS to revise the IM/IRA. The IM/IRA will undergo a 45-day public review period currently scheduled for early 2003. Fieldwork will follow design efforts in early 2004 and is scheduled for completion in 2005.

#### 3.4 Closure of the Solar Evaporation Ponds (IHSS 000-101)

Closure of the Solar Evaporation Ponds (SEP) at RFETS, is proposed under alternative RCRA Interim Status closure requirements found in 6 CCR 1007-3, 265.110(d), because a release from the SEP has occurred and releases from other units in the area of the SEP have also contributed to this contamination. This alternative approach allows contamination from these units within this area to be evaluated as one Area of Concern (AOC), and allows RCRA closure using a risk-based analysis and compliance with the closure performance standards in 6 CCR 1007-3, 265.111(a) and (b). A risk assessment was performed based on identified COCs within the AOC, these findings are included in a Proposed Action Memorandum (PAM).

The risk assessment included an evaluation of existing soil and pond liner material analytical data stored in electronic format in the RFETS environmental Soil Water Database (SWD). The data were collected during previous Phase I field investigations and site-wide sampling programs. These data were screened and COCs were selected and evaluated to determine the risk posed to future human wildlife refuge workers (WRW). Based on the results of the risk assessment, the cumulative hazard index (HI) for noncarcinogenic health effects 0.04, well below the accepted cutoff of 1. The total cancer risk to a WRW due to RCRA constituents is below 1 excess cancer case per 1 million exposed individuals ( $1E-06$ ) at  $4E-07$ . The total cancer risk to a WRW due to radionuclides is  $3E-06$ , with the major contributor to risk being americium-241 and uranium-238.

Corrective action of existing groundwater contamination, including treatment, is addressed in a separate Interim Measure/Interim Remedial Action (IM/IRA) decision document.

The other units within the AOC were removed as a separate action under the RFCA Standard Operating Protocol (RSOP) for Routine Soil Remediation (ER RSOP, DOE 2002a) (refer to ER RSOP FY02 Notification #02-08, DOE 2002b). These components included the removal of concrete slabs, abovegrade lines, segments of belowgrade lines, valve vaults, collection sumps, manholes, electrical control conduit and other utilities, associated support racks, concrete ramps and barriers. To determine whether contamination was present at specific locations where soil or component removal was anticipated, an Industrial Area Sampling and Analysis Plan (IASAP) Addendum was also submitted (IASAP Addendum #IA-02-07, DOE 2002c). Soil with contaminant concentrations greater than RFCA Tier I ALs and associated debris were removed in accordance with RFCA and the ER RSOP. In addition, lysimeters and unnecessary groundwater monitoring wells were abandoned as a separate action under the Well Abandonment and Replacement Program (WARP) (K-H 2002b).

Based on applying the alternative closure requirements, the results of the risk assessment indicate RCRA constituents pose less than  $1E-05$  residual risk for a WRW and, with the completion of

the actions performed under the ER RSOP and IASAP, the SEP meet the closure performance standards of 6 CCR 1007-3, 265 111(a) and (b) In addition, the radiological contaminants remaining within the SEP AOC soil, are all below RFCA Tier I ALs and are below 1E-05 risk to a WRW Therefore, NFA is proposed for the SEP and SEP AOC Upon approval of the PAM, the pond berms will be pushed into the ponds, clean fill soil will be brought in, and the area will be regraded and vegetated as a best management practice

### 3 5 Demolished Site Buildings Through September 27, 2002

The following table (Table 3 5) is a comprehensive list of buildings located at the Rock Flats Environmental Technology Site which have been demolished through FY02 The list is included in the HRR reporting process because, in places, IHSSs, PACs, and UBC sites are located immediately within or under the facilities

**Table 3.5 Demolished Rocky Flats Buildings Through September 27, 2002**

<b>FY D&amp;D</b>	<b>Date of D&amp;D</b>	<b>Property Identifier</b>	<b>Property Name</b>
2002	November 26, 2001	111	Administration
2002	April 05, 2002	123 Pad	123 Concrete Pad (facility D&D'd)
2002	April 05, 2002	123S Pad	123S Concrete Pad (facility D&D'd)
2002	March 01, 2002	S125	Storage Shed (south of 125)
2002	October 19, 2001	C130	Storage Yard Container (cargo containers w/roof)
2002	November 08, 2001	132PAD	132 Electncal Substation Pad
2002	September 09, 2002	262	No 2 Diesel Fuel Storage Tank (Abandoned March 1999), aka D-262, UST 4, northeast of 381, aka Tank 4 - does not need to be removed if 3 feet below grade - Closure Report from Contract RM000019RR2, October 1997 09/09/2002 - refoamed in place
2002	November 09, 2001	333	Paint Shop and Sand Blast Facility
2002	October 19, 2001	373	Cooling Tower - B374
2002	December 03, 2001	377	Air Compressor Building (Production)
2002	December 03, 2001	378	Waste Collection Pump House
2002	August 06, 2002	381	Fluorine Building
2002	May 23, 2002	T428B	Trailer (Sold)
2002	April 09, 2002	442L	RAD Ops / Glovebox Center Training
2002	April 09, 2002	442W	HEPA Filter Warehouse
2002	July 09, 2002	442 Pad	442 Concrete Pad (facility D&D'd)
2002		446 Pad	446 Concrete Pad (facility D&D'd)
2002	July 09, 2002	452	Human Resources Office Building
2002	July 29, 2002	452 Pad	452 Pad (facility D&D'd)
2002	June 17, 2002	T452A	Trailer (Offices)
2002	June 17, 2002	T452B	Trailer (Offices)
2002	June 18, 2002	T452C	Trailer (Offices)
2002	June 18, 2002	T452D	Trailer (Offices)
2002	May 23, 2002	T452E	Rest Rooms
2002	May 21, 2002	T452F	Trailer (Offices) (Sold)



**Table 3.5 Demolished Rocky Flats Buildings Through September 27, 2002**

<b>FY D&amp;D</b>	<b>Date of D&amp;D</b>	<b>Property Identifier</b>	<b>Property Name</b>
2002	June 17, 2002	T452G	Trailer (Offices)
2002	July 18, 2002	T452 Pad	T452 Pads (trailers D&D'd)
2002	November 10, 2001	550	Guard Tower T-3
2002	January 18, 2002	T551A	Trailer - Contractor Offices (vacant)
2002	November 27, 2001	560	Cooling Tower - B559 noticed gone 11/27/01
2002	August 01, 2002	662	Storage (Plant Power)
2002	September, 2002	662 Pad	662 Concrete Pad
2002	August 01, 2002	663	Storage and Shipping
2002	September 2002	663 Pad	663 Concrete Pad
2002	May 30, 2002	T690N	Trailer - Administration (Sold)
2002	October 19, 2001	702	Pump House - Tower 712
2002	October 19, 2001	703	Pump House - Cooling Tower 713
2002	November 15, 2001	709	Cooling Tower - B707 - 4,000 Tons
2002	April 22, 2002	709A	Emergency Diesel Pump (out of service)
2002	October 19, 2001	712	Cooling Tower for B776/777/779A
2002	October 19, 2001	712A	Propane Mix Shed
2002	October 19, 2001	713	Cooling Tower for B776/777/779A
2002	December 03, 2001	713A	Valve Pit (east of 713)
2002	October 26, 2001	774A	Waste Treatment Plant RCA Tank (nw of 774T)
2002	October 26, 2001	774B	Waste Treatment Plant Non RCA (nw of 774T)
2002	November 10, 2001	761	Guard Tower
2002	May 21, 2002	828	Process Waste Pit B886 Low Level Inactive
2002	June 26, 2002	850	Logistics/Office Space/Cafetena
2002		850 Pad	850 Concrete Pad
2002	July 02, 2002	864	Guard Union Office (former Guard Post)
2002		864 Pad	664 Concrete Pad
2002	July 08, 2002	875	Filter Plenum B886 Zone 1
2002	June 24, 2002	880	Storage Shed
2002	February 07, 2002	T883D	Trailer - Rest Rooms (Sold)
2002	April 13, 2002	886	Nuclear Safety Criticality Lab
2002	April 2002	886 Pad	886 Concrete Pad
2002	December 20, 2001	S886	Bus Stop/Car Pool Shelter (north of 886) personal property
2002	March 11, 2002	T886A	Trailer (Offices)
2002	August 28, 2002	T886B	Trailer (Offices)
2002	August 26, 2002	T886C	Trailer (Offices)
2002	December 20, 2001	888	Guard Post
2002	July 08, 2002	889 Pad	889 Concrete Pad
2002	May 31, 2002	T891D	Trailer (Offices)
2002	August 23, 2002	T891F	Trailer (Offices) (Sold)
2002	September 04, 2002	T891E	Trailer (Offices)
2002	February 07, 2002	T891G	Trailer (Offices)

**Table 3.5 Demolished Rocky Flats Buildings Through September 27, 2002**

<b>FY D&amp;D</b>	<b>Date of D&amp;D</b>	<b>Property Identifier</b>	<b>Property Name</b>
2002	February 07, 2002	T891O	Trailer (Offices) (Sold)
2002	September 04, 2002	T891P	Trailer (Offices)
2002	September 04, 2002	T891Q	Trailer (Shower)
2002	April 01, 2002	T891R	Trailer (Offices) (Sold 03/22/02)
2002	February 07, 2002	T891V	Trailer (Offices) (originally T690J) (Sold)
2002	August 09, 2002	T893A	Trailer (Offices)
2002	August 15, 2002	T893B	Trailer (Offices)
2002	February 07, 2002	T900C	Trailer – OU2 Office Trailer/Surface Water Treatment (Sold)
2002	October 19, 2001	T900D	Trailer – OU2 Office Trailer/Surface Water Treatment
2002	May 30, 2002	T900E	Trailer – OU2 Soil Vapor Extraction (SVE) Unit
2002	November 10, 2001	901	Guard Tower
2002	September 06, 2002	910-G1	Gas Generator 1 - Building 910 (north)
2002	August 27, 2002	910-G2	Gas Generator 2 - Building 910 (middle) (sold)
2002	August 27, 2002	910-G3	Gas Generator 3 - Building 910 (south) (sold)
2002	February 12, 2002	932	Effluent Monitor Station - Pond A-1
2002	August 08, 2002	Tent 14	A-4 Pond Storage Tent, a k a Building 944
2002	July 08, 2002	Tank 018	Process Waste Tank, south of 884, west of 889 Pad, within concrete pad T-40 North and South foamed 7/25/96 (RF/ER-96-0050) RCRA unit closure required
2002	July 08, 2002	Tank 019	Process Waste Tank, south of 884, west of 889 Pad, within concrete pad, T-40 North and South foamed 7/25/96 (RF/ER-96-0050) RCRA unit closure required
2002	March 11, 2002	Tank 039	Underground Contaminated Wastewater Tank (828 Pit) Removed
2002	June 11, 2002	Tank 115	Propane Storage Tank, NDT 2300, north of 335 (out of service)
2002	November 01, 2001	Tank 163	100,000 gal Product Water Tank, NDT 0002
2002	November 01, 2001	Tank 164	100,000 gal Product Water Tank, NDT 0001
2002	November 01, 2001	Tank 165	Cement Silo, NDT 0003, (west of 377)
2002	November 07, 2001	Tank 167	Nitric Acid Storage Tank, NDT 0005, ID 450-611 (north of 374)
2002	December 03, 2001	Tank 168	Potassium Hydroxide Storage Tank, NDT 0006, D-225, ID 450-609 (north of 374)
2002	December 03, 2001	Tank 169	Potassium Hydroxide Storage Tank, NDT 0007, D-842, ID 450-610 (north of 374)
2002	July 31, 2002	Tank 175	Liquid Nitrogen Storage Tank (north of 771C)
2002	November 13, 2001	Tank 185	Potassium Hydroxide Holding Tank 771-4204 Tank NDT 1191, (southeast of 714), removed
2002	December 13, 2001	Tank 208	Liquid Argon Storage Tank (south of 707)
2002	December 13, 2001	Tank 209	Helium Storage Tank V-41 (south of 707)
2002	December 13, 2001	Tank 210	Helium Storage Tank V-41 (south of 707)
2002	December 13, 2001	Tank 211	Helium Storage Tank V-41 (south of 707)
2002	December 13, 2001	Tank 212	Helium Storage Tank V-41 (south of 707)
2002	December 13, 2001	Tank 213	Helium Storage Tank V-42 (south of 707)

**Table 3.5 Demolished Rocky Flats Buildings Through September 27, 2002**

<b>FY D&amp;D</b>	<b>Date of D&amp;D</b>	<b>Property Identifier</b>	<b>Property Name</b>
2002	December 13, 2001	Tank 214	Helium Storage Tank V-42 (south of 707)
2002	December 13, 2001	Tank 215	Helium Storage Tank V-42, (south of 707)
2002	December 13, 2001	Tank 216	Helium Storage Tank V-42, (south of 707)
2002	December 13, 2001	Tank 217	Helium Storage Tank V-42, (south of 707)
2002	December 13, 2001	Tank 218	Helium Storage Tank V-42, (south of 707)
2002	December 13, 2001	Tank 219	Helium Storage Tank V-42, (south of 707)
2002	December 13, 2001	Tank 220	Helium Storage Tank V-42, (south of 707)
2002	December 13, 2001	Tank 221	Helium Storage Tank V-42, (south of 707)
2002	December 13, 2001	Tank 223	Liquid Nitrogen Storage Tank, (southwest corner of 707) NDT 0607
2002	January 08, 2002	Tank 284	Helium Storage Tank (south of 707)
2002	March 11, 2002	Tank 294	Storage Tank, UST, (828 Pit) Removed
2002	June 11, 2002	Tank 331	Diesel Blend, Tent 14 Pond A-4, NDT 2980
2002	June 06, 2002	Tank 332	Propane Tank, Tent 14 Pond A-4, NDT 2978, return to vendor
2002	May 21, 2002	Tank 333	Propane Tank, Tent 14 Pond A-4, NDT 2979, return to vendor

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## **Appendix 1**

### **HRR SITES**

#### **IHSSs, PACs, & UBCs** **(Comprehensive Status List)**

**Appendix 1. HRR Sites at RFETS**

IHSS	OU	PAC	Description	Identified	Updated	Proposed NFA	NFA Recommendation Approved
<b>NORTHEAST BUFFER ZONE</b>							
110	BZ	NE-110	Trench T-3	HRR <sup>1</sup>	Annual 1996 <sup>2</sup> Annual 1997 <sup>3</sup> Annual 2000 <sup>26</sup> Annual 2002 <sup>15</sup>	Annual 1997 <sup>3</sup> Annual 2000 <sup>26</sup>	2002 <sup>12</sup>
111 1	BZ	NE-111 1	Trench T-4	HRR <sup>1</sup>	Annual 1996 <sup>2</sup> Annual 1997 <sup>3</sup>	Annual 1997 <sup>3</sup>	1999 <sup>27</sup>
111 2	BZ	NE-111 2	Trench T-5	HRR <sup>1</sup>	-	-	-
111 3	BZ	NE-111 3	Trench T-6	HRR <sup>1</sup>	-	-	-
111 4	BZ	NE-111 4	Trench T-7	HRR <sup>1</sup>	-	-	-
111 5	BZ	NE-111 5	Trench T-8	HRR <sup>1</sup>	-	-	-
111 6	BZ	NE-111 6	Trench T-9	HRR <sup>1</sup>	-	-	-
111 7	BZ	NE-111 7	Trench T-10	HRR <sup>1</sup>	-	-	-
111 8	BZ	NE-111 8	Trench T-11	HRR <sup>1</sup>	-	-	-
142 1	6	NE-142 1	Pond A-1	HRR <sup>1</sup>	Annual 1997 <sup>3</sup>	Annual 1997 <sup>3</sup>	-
142 2	6	NE-142 2	Pond A-2	HRR <sup>1</sup>	Annual 1997 <sup>3</sup>	Annual 1997 <sup>3</sup>	-
142 3	6	NE-142 3	Pond A-3	HRR <sup>1</sup>	Annual 1997 <sup>3</sup>	Annual 1997 <sup>3</sup>	-
142 4	6	NE-142 4	Pond A-4	HRR <sup>1</sup>	Annual 1997 <sup>3</sup>	Annual 1997 <sup>3</sup>	-
142 5	6	NE-142 5	Pond B-1	HRR <sup>1</sup>	Annual 1997 <sup>3</sup>	Annual 1997 <sup>3</sup>	-
142 6	6	NE-142 6	Pond B-2	HRR <sup>1</sup>	Annual 1997 <sup>3</sup>	Annual 1997 <sup>3</sup>	-
142 7	6	NE-142 7	Pond B-3	HRR <sup>1</sup>	Annual 1997 <sup>3</sup>	Annual 1997 <sup>3</sup>	-
142 8	6	NE-142 8	Pond B-4	HRR <sup>1</sup>	Annual 1997 <sup>3</sup>	Annual 1997 <sup>3</sup>	-

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**Appendix 1. HRR Sites at RFETS**

IHSS	OU	PAC	Description	Identified	Updated	Proposed NFA	NFA Recommendation Approved
142 9	6	NE-142 9	Pond B-5	HRR <sup>1</sup>	Annual 1997 <sup>3</sup>	Annual 1997 <sup>3</sup>	-
142 12	6	NE-142 12	Flume Pond (IAG Name Newly Identified Pond A-5) (off-scale of Plate #1)	HRR <sup>1</sup>	Annual 1996 <sup>2</sup>	Annual 1996 <sup>2</sup>	-
156 2	6	NE-156 2	Soil Dump Area Between the A and B Series Drainages	HRR <sup>1</sup>	Annual 1997 <sup>3</sup>	Annual 1997 <sup>3</sup>	1999 <sup>27</sup>
166 1	6	NE-166 1	Trench A	HRR <sup>1</sup>	Annual 1996 <sup>2</sup>	Annual 1996 <sup>2</sup>	2002 <sup>32</sup>
166 2	6	NE-166 2	Trench B	HRR <sup>1</sup>	Annual 1996 <sup>2</sup>	Annual 1996 <sup>2</sup>	2002 <sup>32</sup>
166 3	6	NE-166 3	Trench C (two areas designated on Plate #2)	HRR <sup>1</sup>	Annual 1996 <sup>2</sup>	Annual 1996 <sup>2</sup>	2002 <sup>32</sup>
167 1	6	NE-167 1	Landfill North Area Spray Field	HRR <sup>1</sup>	Annual 1997 <sup>3</sup>	Annual 1997 <sup>3</sup>	1999 <sup>27</sup>
167 2	7	NE-167 2	Pond Area Spray Field (Center Area)	HRR <sup>1</sup>	Annual 1996 <sup>2</sup>	Annual 1996 <sup>2</sup>	2002 <sup>32</sup>
167 3	7	NE-167 3	South Area Spray Field	HRR <sup>1</sup>	Annual 1996 <sup>2</sup>	Annual 1996 <sup>2</sup>	2002 <sup>32</sup>
216 1	6	NE-216 1	East Spray Fields - North Area	HRR <sup>1</sup>	Annual 1996 <sup>2</sup>	Annual 1996 <sup>2</sup>	2002 <sup>32</sup>
216 2	BZ	NE-216 2	East Spray Field	HRR <sup>1</sup>	Annual 1997 <sup>3</sup>	Annual 1997 <sup>3</sup>	-
216 3	BZ	NE-216 3	East Spray Field	HRR <sup>1</sup>	Annual 1997 <sup>3</sup>	Annual 1997 <sup>3</sup>	-
NA	BZ	NE-1400	Tear Gas Powder Release	HRR <sup>1</sup>	-	-	EPA, 1992 <sup>4</sup> 2002 <sup>32</sup>
NA	BZ	NE-1401	NE Buffer Zone Gas Line Break	HRR <sup>1</sup>	-	-	EPA, 1992 <sup>4</sup> 2002 <sup>32</sup>
NA	BZ	NE-1402	East Inner Gate PCB Spill	HRR <sup>1</sup>	-	-	EPA, 1992 <sup>4</sup> 2002 <sup>32</sup>

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**Appendix 1. HRR Sites at RFETS**

IHSS	OU	PAC	Description	Identified	Updated	Proposed NFA	NFA Recommendation Approved
NA	BZ	NE-1403	Gasoline Spill - Building 920 Guard Post	HRR <sup>1</sup>	-	-	EPA, 1992 <sup>4</sup> 2002 <sup>32</sup>
142 6	BZ	NE-1404	Diesel Spill at Pond B-2 Spillway	Quarterly 2 <sup>5</sup>	Quarterly 3 <sup>6</sup> Annual 1998 <sup>7</sup>	Annual 1998 <sup>7</sup>	2002 <sup>14</sup>
NA	BZ	NE-1405	Diesel Fuel Spill at Field Treatability Unit (identified as NE-1404, reassigned NE-1405 in Quarterly 7 <sup>9</sup> )	Quarterly 3 <sup>6</sup>	Quarterly 4 <sup>8</sup> Quarterly 7 <sup>9</sup> Annual 1998 <sup>7</sup>	Annual 1998 <sup>7</sup>	1999 <sup>28</sup>
NA	BZ	NE-1406	771 Hillside Sludge Release	Quarterly 4 <sup>8</sup>	Annual 1998 <sup>7</sup>	Annual 1998 <sup>7</sup>	1999 <sup>28</sup>
NA	BZ	NE-1407	OU 2 Treatment Facility	Quarterly 4 <sup>8</sup>	Quarterly 7 <sup>9</sup> (900-1312) Quarterly 8 <sup>15</sup> (900-1309)	Annual 2002	-
NA	BZ	NE-1408	OU 2 Test Well (formerly NE-1406)	Quarterly 4 <sup>8</sup>	Quarterly 7 <sup>9</sup>	Annual 1999 <sup>21</sup>	2000 <sup>29</sup>
NA	BZ	NE-1409	Modular Tanks and 910 Treatment System Spill (formerly 000-503)	Quarterly 5 <sup>10</sup>	Quarterly 7 <sup>9</sup> Annual 2000 <sup>26</sup>	Annual 1999 <sup>23</sup> Annual 2000 <sup>26</sup>	2001 <sup>31</sup> 2002 <sup>32</sup>
NA	BZ	NE-1410	Diesel Fuel Spill at Field Treatability Unit	Quarterly 7 <sup>9</sup>	-	Quarterly 7 <sup>9</sup>	2002 <sup>14</sup>
NA	BZ	NE-1411	Diesel Fuel Overflowed from Tanker at OU 2 Field Treatability Unit	Quarterly 7 <sup>9</sup>	-	Quarterly 7 <sup>9</sup>	2002 <sup>14</sup>
NA	BZ	NE-1412	Trench T-12 Located in OU 2 East Trenches	Quarterly 10 <sup>11</sup>	-	-	-

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**Appendix 1. HRR Sites at RFETS**

IHSS	OU	PAC	Description	Identified	Updated	Proposed NFA	NFA Recommendation Approved
NA	BZ	NE-1413	Trench T-13 Located in OU 2 East Trenches	Quarterly 10 <sup>11</sup>	-	-	-
114	7	NW-114	Present Landfill	HRR <sup>1</sup>	-	-	-
170	BZ	NW-170	PU&D Storage Yard - Waste Spills	HRR <sup>1</sup>	Annual 1997 <sup>3</sup> Annual 1998 <sup>7</sup> Annual 2002 <sup>35</sup>	Annual 1998 <sup>7</sup> Annual 1999 <sup>23</sup>	2002 <sup>34</sup>
174A	BZ	NW-174A	PU&D Yard Container Storage Area	HRR <sup>1</sup>	Annual 1997 <sup>3</sup> Annual 1998 <sup>7</sup>		-
174B	BZ	NW-174B	PU&D Container Storage Facilities	HRR <sup>1</sup>	Annual 1997 <sup>3</sup> Annual 1998 <sup>7</sup>	Annual 1998 <sup>7</sup> Annual 1999 <sup>23</sup>	1999 <sup>28</sup>
195	16	NW-195	Nickel Carbonyl Disposal	HRR <sup>1</sup>	Annual 1996 <sup>2</sup>	-	OU 16 CAD/ROD <sup>12</sup>
203	7	NW-203	Inactive Hazardous Waste Storage Area	HRR <sup>1</sup>	Annual 1996 <sup>2</sup> Annual 1998 <sup>7</sup>	Annual 1998 <sup>7</sup>	1999 <sup>28</sup>
NA	BZ	NW-1500	Diesel Spill at PU&D Yard (formerly NW-175)	Quarterly 3 <sup>6</sup>	Quarterly 7 <sup>9</sup> Annual 1998 <sup>7</sup>	Annual 1998 <sup>7</sup>	1999 <sup>28</sup>
NA	BZ	NW-1501	Asbestos Release at PU&D Yard (formerly NW-176)	Quarterly 3 <sup>6</sup>	Quarterly 7 <sup>9</sup>	Annual 1999 <sup>23</sup>	2000 <sup>29</sup>
114	7	NW-1502	Improper Disposal of Diesel-Contaminated Material at Landfill (formerly NW-177)	Quarterly 2 <sup>5</sup>	Quarterly 3 <sup>6</sup> Quarterly 7 <sup>9</sup>	Quarterly 7 <sup>9</sup>	2002 <sup>12</sup>
114	7	NW-1503	Improper Disposal of Fuel-Contaminated Material at Landfill	Quarterly 1 <sup>24</sup>	Quarterly 7 <sup>9</sup>	Quarterly 7 <sup>9</sup>	2002 <sup>12</sup>

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**Appendix 1. HRR Sites at RFETS**

IHSS	OU	PAC	Description	Identified	Updated	Proposed NFA	NFA Recommendation Approved
114	7	NW-1504	Improper Disposal of Thorosilane-Contaminated Material at Landfill	Quarterly 7 <sup>9</sup>	-	Quarterly 7 <sup>9</sup>	2002 <sup>14</sup>
NA	BZ	NW-1505	North Firing Range	Annual 2001	Annual 2001 -		-
<b>SOUTHEAST BUFFER ZONE</b>							
142 10	5	SE-142 10	Pond C-1	HRR <sup>1</sup>	Annual 1997 <sup>3</sup>	Annual 1997 <sup>3</sup>	-
142 11	5	SE-142 11	Pond C-2	HRR <sup>1</sup>	Annual 1997 <sup>3</sup>	Annual 1997 <sup>3</sup>	-
209	5	SE-209	Surface Disturbance Southeast of Bldg 881	HRR <sup>1</sup>	Annual 1997 <sup>3</sup>	Annual 1997 <sup>3</sup>	1999 <sup>27</sup>
NA	BZ	SE-1600	Pond 7-Stream Condensate Releases	HRR <sup>1</sup>	Annual 2002 <sup>35</sup>	-	EPA, 1992 <sup>4</sup> , 2002 <sup>14</sup>
NA	BZ	SE-1601	Pond 8 - Cooling Tower Discharge Releases	HRR <sup>1</sup>	Annual 2002 <sup>35</sup>	-	EPA, 1992 <sup>4</sup> , 2002 <sup>14</sup>
155	BZ	SE-1602	East Firing Range	Annual 1999 <sup>23</sup>	-	-	-
<b>SOUTHWEST BUFFER ZONE</b>							
115	IA	SW-115	Original Landfill	HRR <sup>1</sup>	-	-	
133 1	5	SW-133 1	Ash Pit 1	HRR <sup>1</sup>	Annual 2001	Annual 2001	Deferred
133 2	5	SW-133 2	Ash Pit 2	HRR <sup>1</sup>	Annual 2001 Annual 2002 <sup>15</sup>	Annual 2001	Deferred
133 3	5	SW-133 3	Ash Pit 3	HRR <sup>1</sup>	Annual 2001	Annual 2001	2002 <sup>12</sup>
133 4	5	SW-133 4	Ash Pit 4	HRR <sup>1</sup>	Annual 2001 Annual 2002 <sup>35</sup>	Annual 2001	Deferred

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**Appendix 1. HRR Sites at RFETS**

IHSS	OU	PAC	Description	Identified	Updated	Proposed NFA	NFA Recommendation Approved
133 5	5	SW-133 5	Incinerator Facility	HRR <sup>1</sup>	Annual 1997 <sup>1</sup> Annual 2001	Annual 1997 <sup>3</sup> Annual 2001	-
133 6	5	SW-133 6	Concrete Wash Pad	HRR <sup>1</sup>	Annual 1997 <sup>1</sup> Annual 2001	Annual 1997 <sup>3</sup> Annual 2001	-
196	1A	SW-196	Water Treatment Plant Backwash Pond	HRR <sup>1</sup>	-	-	-
NA	BZ	SW-1700	Fuel Spill into Woman Creek Drainage	HRR <sup>1</sup>	-	-	EPA, 1992 <sup>4</sup> 2002 <sup>12</sup>
NA	5	SW-1701	Recently Identified Ash Pit (also referred to as TDEM-1)	Quarterly 9 <sup>13</sup>	Annual 1997 <sup>3</sup> Annual 2001	Annual 1997 <sup>3</sup> Annual 2001	2002 <sup>12</sup>
NA	5	SW-1702	Recently Identified Ash Pit (also referred to as TDEM-2)	Quarterly 9 <sup>13</sup>	Annual 2001	Annual 2001	Deferred
<b>700 AREA</b>							
101	1A	000-101	207 Solar Evaporation Ponds	HRR <sup>1</sup>	Annual 1998 <sup>7</sup>	-	-
121	1A	000-121	Original Process Waste Lines (includes Tanks T-2, T-3, T-10, T-14, T-16, T-40)	HRR <sup>1</sup>	Annual 1996 <sup>2</sup> Annual 1998 <sup>7</sup> (UBC 123)	Annual 2002 (Tank 40 only)	-
162	1A	000-162	Radioactive Site - 700 Area Site # 2	HRR <sup>1</sup>	-	-	-
168	11	000-168	West Spray Field	HRR <sup>1</sup>	Annual 1996 <sup>2</sup>	-	OU 11 CAD/ROD <sup>14</sup>
172	1A	000-172	Central Avenue Waste Spill	HRR <sup>1</sup>	Annual 1998 <sup>7</sup>	Annual 1998 <sup>7</sup>	1999 <sup>28</sup>
190	1A	000-190	Caustic Leak (also referred to as Central Avenue Ditch)	HRR <sup>1</sup>	-	-	-
192	16	000-192	Antifreeze Discharge	HRR <sup>1</sup>	Annual 1996 <sup>2</sup>	-	OU 16 CAD/ROD <sup>12</sup>

**Appendix 1. HRR Sites at RFETS**

IHSS	OU	PAC	Description	Identified	Updated	Proposed NFA	NFA Recommendation Approved
NA	IA	000-500	Sanitary Sewer System (not shown on Plate 4)	HRR <sup>1</sup>	-	-	-
NA	BZ	000-501	Roadway Spraying	HRR <sup>1</sup>	-	-	EPA, 1992 <sup>4</sup> 2002 <sup>12</sup>
NA	IA	000-502 (see 900-1310)	ITS Water Spill (identified in Quarterly 2 as 000-502, reassigned as 900-1310 in Quarterly 7, the number 000-502 is no longer in use )	Quarterly 2 <sup>5</sup>	NA	NA	NA
NA	IA	000-503	Solar Pond Water Spill Along Central Avenue	Quarterly 7 <sup>9</sup>	-	Quarterly 7 <sup>9</sup>	2002 <sup>14</sup>
NA	IA	000-504	New Process Waste Lines	Annual 1999 <sup>23</sup>	-	-	-
NA	IA	000-505	Storm Drains	Annual 1999 <sup>23</sup>	-	-	-
<b>100 AREA</b>							
148	IA	100-148	Waste Spills	HRR <sup>1</sup>	Annual 1998 <sup>7</sup> (UBC 123)	Annual 2002	-
NA	IA	100-600	Mercury Spill-Valve Vault 124-B, Building 124	HRR <sup>1</sup>	-	-	EPA, 1992 <sup>4</sup> 2002 <sup>12</sup>
NA	IA	100-601	Building 123 Phosphoric Acid Spill	HRR <sup>1</sup>	-	-	EPA, 1992 <sup>4</sup> 2002 <sup>12</sup>
NA	IA	100-602	Building 123 Process Waste Line Break	HRR <sup>1</sup>	-	-	-
NA	IA	100-603	Building 123 Bioassay Waste Spill	HRR <sup>1</sup>	Annual 2001 Annual 2002 <sup>36</sup>	Annual 2001	2002 <sup>12</sup>

**Appendix 1. HRR Sites at RFETS**

IHSS	OU	PAC	Description	Identified	Updated	Proposed NFA	NFA Recommendation Approved
NA	IA	100-604	T130 Complex Sewer Line Leaks	HRR <sup>1</sup>	-	-	EPA, 1992 <sup>4</sup> 2002 <sup>32</sup>
NA	IA	100-605	Building 115 Hydraulic Oil Spill	HRR <sup>1</sup>	-	-	EPA, 1992 <sup>4</sup> 2002 <sup>32</sup>
NA	IA	100-606	Building 125 TCE Spill	HRR <sup>1</sup>	-	-	EPA, 1992 <sup>4</sup> 2002 <sup>32</sup>
NA	IA	100-607	Building 111 Transformer PCB Leak	HRR <sup>1</sup>	Annual 2000 <sup>26</sup> Annual 2001 Annual 2002 <sup>36</sup>	Annual 2001	2001 <sup>30</sup>
NA	IA	100-608	Building 131 Transformer Leak	HRR <sup>1</sup>	Annual 1998 <sup>7</sup>	Annual 1998 <sup>7</sup>	1999 <sup>28</sup>
NA	IA	100-609	Building 121 Security Incinerator	HRR <sup>1</sup>	-	Annual 2002	-
NA	IA	100-610	Asbestos Release - Building 123	HRR <sup>1</sup>	-	-	EPA, 1992 <sup>4</sup> 2002 <sup>32</sup>
NA	IA	100-611	Building 123 Scrubber Solution Spill	HRR <sup>1</sup>	-	Annual 2002	-
NA	IA	100-612	Battery Solution Spill - Building 119	HRR <sup>1</sup>	-	-	EPA, 1992 <sup>4</sup> 2002 <sup>32</sup>
NA	IA	100-613	Asphalt Surface in Lay-down Yard North of Building 130 (identified as 000-501 in Quarterly 4 <sup>8</sup> , reassigned as 100-613 in Quarterly 7 <sup>9</sup> )	Quarterly 4 <sup>8</sup>	Quarterly 7 <sup>9</sup> Annual 2002 <sup>35</sup>	Quarterly 7 <sup>9</sup>	2002 <sup>34</sup>
<b>300 AREA</b>							
128	IA	300-128	Oil Burn Pit No 1	HRR <sup>1</sup>	-	-	-
134N	IA	300-134N	Lithium Metal Destruction Site	HRR <sup>1</sup>	-	-	-

**Appendix 1. HRR Sites at RFETS**

IHSS	OU	PAC	Description	Identified	Updated	Proposed NFA	NFA Recommendation Approved
134S	IA	300-134S	Lithium Metal Destruction Site	HRR <sup>1</sup>	-	-	-
135	IA	300-135	Cooling Tower Blowdown	HRR <sup>1</sup>	Annual 1997 <sup>3</sup>	Annual 1997 <sup>3</sup>	1999 <sup>27</sup>
151	IA	300-151	Tank 262 Fuel Oil Spills	HRR <sup>1</sup>	Annual 1997 <sup>3</sup>	Annual 1997 <sup>3</sup>	1999 <sup>27</sup>
156 1	IA	300-156 1	Building 371 Parking Lot (two locations designated on Plate #2)	HRR <sup>1</sup>	Annual 1997 <sup>3</sup> Annual 2000 <sup>26</sup>	Annual 1997 <sup>3</sup> Annual 2000 <sup>26</sup>	2001 <sup>31</sup> 2002 <sup>32</sup>
171	IA	300-171	Solvent Burning Ground	HRR <sup>1</sup>	-	-	-
181	IA	300-181	Building 334 Cargo Container Area	HRR <sup>1</sup>	Annual 1997 <sup>3</sup>	Annual 1997 <sup>3</sup>	1999 <sup>27</sup>
186	IA	300-186	Valve Vault 12	HRR <sup>1</sup>	-	-	-
188	IA	300-188	Acid Leak	HRR <sup>1</sup>	Annual 1997 <sup>3</sup>	Annual 1997 <sup>3</sup>	1999 <sup>27</sup>
206	IA	300-206	Inactive D-836 Hazardous Waste Tank	HRR <sup>1</sup>	Annual 2001	Annual 2001	2002 <sup>34</sup>
212	IA	300-212	Building 371 Drum Storage Area, Unit 63 (deferred to Part VIII of the RFETS RCRA Mixed Residues Modification, see Annual 1997)	HRR <sup>1</sup>	Annual 1997 <sup>3</sup>	Annual 1997 <sup>3</sup>	2002 <sup>34</sup>
NA	IA	300-700	Scrap Roofing Disposal (see also BZCR Site 31, Section 3)	HRR <sup>1</sup>	-	-	EPA, 1992 <sup>4</sup> , 2002 <sup>32</sup>
NA	IA	300-701	Sulfuric Acid Spill - Building 371	HRR <sup>1</sup>	-	-	EPA, 1992 <sup>4</sup> , 2002 <sup>32</sup>
NA	IA	300-702	Pesticide Shed	HRR <sup>1</sup>	-	-	-
NA	IA	300-703	Building 331 North Area	HRR <sup>1</sup>	-	-	EPA, 1992 <sup>4</sup> , 2002 <sup>32</sup>
NA	IA	300-704	Roof Fire, Building 381	HRR <sup>1</sup>	-	-	EPA, 1992 <sup>4</sup> , 2002 <sup>32</sup>

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**Appendix 1. HRR Sites at RFETS**

IHSS	OU	PAC	Description	Identified	Updated	Proposed NFA	NFA Recommendation Approved
NA	IA	300-705	Potassium Hydroxide Spill North of Building 374	HRR <sup>1</sup>	-	-	EPA, 1992 <sup>1</sup> , 2002 <sup>12</sup>
NA	IA	300-706	Evaporator Tanks North of Building 374	HRR <sup>1</sup>	-	-	EPA, 1992 <sup>1</sup> , 2002 <sup>12</sup>
NA	IA	300-707	Sanitizer Spill	HRR <sup>1</sup>	-	-	EPA, 1992 <sup>1</sup> , 2002 <sup>12</sup>
NA	IA	300-708	Transformers North of Building 371	HRR <sup>1</sup>	Annual 1996 <sup>2</sup>	Annual 1996 <sup>2</sup>	-
NA	IA	300-709	Transformer Leak 334-1	HRR <sup>1</sup>	Annual 1996 <sup>2</sup>	Annual 1996 <sup>2</sup>	-
NA	IA	300-710	Gasoline Spill North of Building 331	HRR <sup>1</sup>	-	-	EPA, 1992 <sup>1</sup> , 2002 <sup>12</sup>
NA	IA	300-711	Nickel-Cadmium Battery Acid Spill Outside of Building 373	Quarterly 1 <sup>24</sup>	Quarterly 7 <sup>9</sup>	Quarterly 7 <sup>9</sup>	2002 <sup>34</sup>
NA	IA	300-712	0 5-Gallon Antifreeze Spilled by Street Sweeper Outside of Building 373	Quarterly 7 <sup>9</sup>	-	Quarterly 7 <sup>9</sup>	2002 <sup>34</sup>
NA	IA	300-713	Caustic Spill North of Building 331	Quarterly 8 <sup>15</sup>	-	Quarterly 8 <sup>15</sup>	2002 <sup>34</sup>
NA	IA	300-714	Laundry Waste Water Spill from Tank T-803, North of Building 374	Quarterly 10 <sup>11</sup>	-	Quarterly 10 <sup>11</sup>	2002 <sup>34</sup>
NA	IA	300-715	Battery Acid Spill	Annual 1997 <sup>3</sup>	-	Annual 1997 <sup>3</sup>	1999 <sup>27</sup>
116 I	IA	400-116 I	West Loading Dock, Building 447 (IAG Name West Loading Dock Area)	HRR <sup>1</sup>	-	-	-

**Appendix 1. HRR Sites at RFETS**

IHSS	OU	PAC	Description	Identified	Updated	Proposed NFA	NFA Recommendation Approved
116 2	IA	400-116 2	South Loading Dock, Building 444 (IAG Name South Loading Dock Area)	HRR <sup>1</sup>	-	-	-
122	IA	400-122	Underground Concrete Tank	HRR <sup>1</sup>	Annual 1996 <sup>2</sup> (000-121)	-	-
129	IA	400-129	Building 443 Oil Leak (deferred to IA OU, see Annual 1997)	HRR <sup>1</sup>	Annual 1996 <sup>2</sup> Annual 1997 <sup>3</sup>	-	-
136 1	IA	400-136 1	Cooling Tower Pond West of Building 444 (IAG Name Cooling Tower Pond Northeast Corner of Building 460)	HRR <sup>1</sup>	-	-	-
136 2	IA	400-136 2	Cooling Tower Pond East of Building 444 (IAG Name Cooling Tower Pond West of Building 460)	HRR <sup>1</sup>	-	-	-
157 1	IA	400-157 1	Radioactive Site North Area	HRR <sup>1</sup>	-	-	-
157 2	IA	400-157 2	Radioactive Site South Area	HRR <sup>1</sup>	-	-	-
182	IA	400-182	Building 444/453 Drum Storage Area	HRR <sup>1</sup>	-	-	-
187	IA	400-187	Sulfuric Acid Spill (IAG Name Acid Leaks [2])	HRR <sup>1</sup>	-	-	-
191	IA	400-191	Hydrogen Peroxide Spill	HRR <sup>1</sup>	Annual 1997 <sup>3</sup>	Annual 1997 <sup>3</sup>	1999 <sup>27</sup>
193	16	400-193	Steam Condensate Leak	HRR <sup>1</sup>	Annual 1996 <sup>2</sup>	-	OU 16 CAD/ROD <sup>12</sup>
204	15	400-204	Original Uranium Chip Roaster (deferred to D&D and UBC 447, see OU 15 CAD/ROD)	HRR <sup>1</sup>	Annual 1996 <sup>2</sup>	Annual 1996 <sup>2</sup>	2002 <sup>12</sup>
205	IA	400-205	Building 460 Sump #3 Acid Side	HRR <sup>1</sup>	-	-	-
207	IA	400-207	Inactive 444 Acid Dumpster	HRR <sup>1</sup>	-	-	-
208	IA	400-208	Inactive 444/447 Waste Storage Area	HRR <sup>1</sup>	-	-	-

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**Appendix 1. HRR Sites at RFETS**

IHSS	OU	PAC	Description	Identified	Updated	Proposed NFA	NFA Recommendation Approved
NA	IA	400-800	Transformer 443-1	HRR <sup>1</sup>	Annual 1998 <sup>7</sup>	Annual 1998 <sup>7</sup>	1999 <sup>28</sup>
NA	IA	400-801	Transformer, Roof of Building 447	HRR <sup>1</sup>	-	-	-
NA	IA	400-802	Storage Area, South of Building 334	HRR <sup>1</sup>	-	-	-
NA	IA	400-803	Miscellaneous Dumping, Building 460 Storm Drain	HRR <sup>1</sup>	-	-	-
NA	IA	400-804	Road North of Building 460	HRR <sup>1</sup>	-	-	-
NA	IA	400-805	Building 443 Tank #9 Leak	HRR <sup>1</sup>	Annual 2002 <sup>35</sup>	-	EPA, 1992 <sup>4</sup> , 2002 <sup>32</sup>
NA	IA	400-806	Catalyst Spill, Building 440	HRR <sup>1</sup>	-	-	EPA, 1992 <sup>4</sup> , 2002 <sup>32</sup>
NA	IA	400-807	Sandblasting Area	HRR <sup>1</sup>	-	-	-
NA	IA	400-808	Vacuum Pump Leak - Building 442	HRR <sup>1</sup>	-	-	EPA, 1992 <sup>4</sup> , 2002 <sup>32</sup>
NA	IA	400-809	Oil Leak - 446 Guard Post	HRR <sup>1</sup>	-	-	EPA, 1992 <sup>4</sup> , 2002 <sup>32</sup>
NA	IA	400-810	Beryllium Fire - Building 444	HRR <sup>1</sup>	-	-	-
NA	IA	400-811	Transformer 443-2, Building 443	Quarterly 2 <sup>5</sup>	Quarterly 3 <sup>6</sup> Annual 1998 <sup>7</sup>	Annual 1998 <sup>7</sup>	1999 <sup>28</sup>
NA	IA	400-812	Tank T-2 Spill in Building 460	Quarterly 6 <sup>16</sup>	Quarterly 7 <sup>9</sup> Quarterly 8 <sup>15</sup> Annual 2001	Quarterly 8 <sup>15</sup> Annual 2001	2002 <sup>32</sup>
NA	IA	400-813	RCRA Tank Leak in Building 460	Quarterly 7 <sup>9</sup>	-	-	-

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**Appendix 1. HRR Sites at RFETS**

IHSS	OU	PAC	Description	Identified	Updated	Proposed NFA	NFA Recommendation Approved
NA	IA	400-814	Air Conditioner Compressor Release, Bldg 444 Roof	Quarterly 8 <sup>15</sup>	-	Quarterly 8 <sup>15</sup>	2002 <sup>14</sup>
NA	IA	400-815	RCRA Tank Leak in Building 460	Quarterly 8 <sup>15</sup>	-	-	-
NA	IA	400-820 (see 600-1004)	Central Avenue Ditch Soil Spreading (identified in Quarterly 6 as 400-820, reassigned as 600-1004 in Quarterly 7, the number 400-820 is no longer in use)	Quarterly 6 <sup>16</sup>	Quarterly 7 <sup>9</sup>	NA	NA
<b>500 AREA</b>							
117 1	IA	500-117 1	North Site Chemical Storage	HRR <sup>1</sup>	-	-	-
117 2	IA	500-117 2	Middle Site Chemical Storage	HRR <sup>1</sup>	-	-	-
158	IA	500-158	Radioactive Site -- Building 551	HRR <sup>1</sup>	-	-	-
159	IA	500-159	Radioactive Site -- Building 559	HRR <sup>1</sup>	-	-	-
169	IA	500-169	Waste Drum Peroxide Burial	HRR <sup>1</sup>	Annual 1998 <sup>7</sup> Annual 2000 <sup>26</sup>	Annual 1998 <sup>7</sup>	-
197	IA	500-197	Scrap Metal Sites	HRR <sup>1</sup>	-	-	-
NA	IA	500-900	Transformer Leak -- 515/516	HRR <sup>1</sup>	Annual 1996 <sup>2</sup>	Annual 1996 <sup>2</sup>	-
NA	IA	500-901	Transformer Leak -- 555	HRR <sup>1</sup>	Annual 1996 <sup>2</sup>	Annual 1996 <sup>2</sup>	-
NA	IA	500-902	Transformer Leak -- 559	HRR <sup>1</sup>	Annual 1996 <sup>2</sup>	Annual 1996 <sup>2</sup>	-
NA	IA	500-903	RCRA Storage Unit #1	HRR <sup>1</sup>	-	-	EPA, 1992 <sup>4</sup> , 2002 <sup>32</sup>
NA	IA	500-904	Transformer Leak -- 223-1/223-2	HRR <sup>1</sup>	-	-	-
NA	IA	500-905	Transformer Leak -- 558-1	HRR <sup>1</sup>	Annual 1996 <sup>2</sup>	Annual 1996 <sup>2</sup>	-

**Appendix 1. HRR Sites at RFETS**

IHSS	OU	PAC	Description	Identified	Updated	Proposed NFA	NFA Recommendation Approved
NA	IA	500-906	Asphalt Surface Near Building 559	Quarterly 4 <sup>8</sup>	-	Annual 2002	-
172	IA	500-907	Tanker Truck Release of Hazardous Waste from Tank 231B	Quarterly 9 <sup>13</sup>	-	-	-
156 1, 186	IA	500-908	Oil Released from Air Compressor	Quarterly 12 <sup>17</sup>	-	Quarterly 12 <sup>17</sup>	2002 <sup>14</sup>
158	IA	500-909	Release of Spent Photographic Fixer Solution	Annual 1996 <sup>2</sup>	-	Annual 1996 <sup>2</sup>	2002 <sup>32</sup>
<b>600 AREA</b>							
117 3	IA	600-117 3	Chemical Storage - South Site	HRR <sup>1</sup>	Annual 1997 <sup>3</sup>	Annual 1997 <sup>3</sup>	1999 <sup>27</sup>
120 1	IA	600-120 1	Fiberglassing Area North of Building 664	HRR <sup>1</sup>	-	-	-
120 2	IA	600-120 2	Fiberglassing Area West of Building 664	HRR <sup>1</sup>	-	-	-
152	IA	600-152	Fuel Oil Tank 221 Spills	HRR <sup>1</sup>	Annual 1997 <sup>3</sup>	Annual 1997 <sup>3</sup>	1999 <sup>27</sup>
160	IA	600-160	Radioactive Site Building 444 Parking Lot	HRR <sup>1</sup>	-	-	-
161	IA	600-161	Radioactive Site - Building 664	HRR <sup>1</sup>	-	-	-
164 1	IA	600-164 1	Radioactive Slab from Bldg 771	HRR <sup>1</sup>	Annual 1997 <sup>3</sup> Annual 2000 <sup>26</sup> Annual 2002 <sup>36</sup>	Annual 1997 <sup>3</sup> Annual 2000 <sup>26</sup>	2001 <sup>31</sup> 2002 <sup>32</sup>
189	IA	600-189	Nitric Acid Tank	HRR <sup>1</sup>	Annual 1997 <sup>3</sup> Annual 2000 <sup>26</sup> Annual 2001	Annual 1997 <sup>3</sup> Annual 2001	2002 <sup>14</sup>
NA	IA	600-1000	Transformer Storage Building 662	HRR <sup>1</sup>	Annual 1996 <sup>2</sup>	Annual 1996 <sup>2</sup>	-
NA	IA	600-1001	Temporary Waste Storage Building 663	HRR <sup>1</sup>	Annual 1997 <sup>3</sup>	-	-

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**Appendix 1. HRR Sites at RFETS**

IHSS	OU	PAC	Description	Identified	Updated	Proposed NFA	NFA Recommendation Approved
NA	IA	600-1001(a)	Waste Oil Identified in PAC-1001	Annual 1997 <sup>1</sup>	Annual 1997 <sup>3</sup> Annual 2000 <sup>26</sup> Annual 2002 <sup>36</sup>	Annual 1997 <sup>3</sup>	1999 <sup>27</sup> 2002 <sup>32</sup>
NA	IA	600-1002	Transformer Storage - West of Building 666	HRR <sup>1</sup>	Annual 1996 <sup>2</sup>	Annual 1996 <sup>2</sup>	-
NA	IA	600-1003	Transformers North and South of 661-675 Substation	HRR <sup>1</sup>	Annual 1996 <sup>2</sup>	Annual 1996 <sup>2</sup>	-
152, 157 1, 172	IA	600-1004	Central Avenue Ditch Cleaning Incident (formerly identified as 400-820)	Quarterly 6 <sup>16</sup>	Quarterly 7 <sup>9</sup>	-	-
NA	IA	600-1005	Former Pesticide Storage Area	Quarterly 7 <sup>9</sup>	-	Annual 2002	-
<b>700 AREA</b>							
118 1	IA	700-118 1	Multiple Solvent Spills West of Building 730	HRR <sup>1</sup>	Annual 1998 <sup>7</sup>	-	-
118 2	IA	700-118 2	Multiple Solvent Spills South End of Building 776	HRR <sup>1</sup>	-	-	-
123 1	IA	700-123 1	Valve Vault 7	HRR <sup>1</sup>	Annual 1997 <sup>3</sup> Annual 2000 <sup>26</sup>	Annual 1997 <sup>3</sup> Annual 2000 <sup>26</sup>	2001 <sup>31</sup> 2002 <sup>32</sup>
123 2	IA	700-123 2	Valve Vault West of Building 707	HRR <sup>1</sup>	-	-	-
124 1	IA	700-124 1	30,000 Gallon Tank (Tank #68)	HRR <sup>1</sup>	Annual 1996 <sup>2</sup> (000-121)	-	-
124 2	IA	700-124 2	14,000 Gallon Tank (Tank #66)	HRR <sup>1</sup>	Annual 1996 <sup>2</sup> (000-121)	-	-
124 3	IA	700-124 3	14,000 Gallon Tank (Tank #67)	HRR <sup>1</sup>	Annual 1996 <sup>2</sup> (000-121)	-	-

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**Appendix 1. HRR Sites at RFETS**

IHSS	OU	PAC	Description	Identified	Updated	Proposed NFA	NFA Recommendation Approved
125	IA	700-125	Holding Tank (Tank #66)	HRR <sup>1</sup>	-	-	-
126 1	IA	700-126 1	Westernmost Out-of-Service Waste Tank	HRR <sup>1</sup>	-	-	-
126 2	IA	700-126 2	Easternmost Out-of-Service Waste Tank	HRR <sup>1</sup>	-	-	-
127	IA	700-127	Low-Level Radioactive Waste Leak	HRR <sup>1</sup>	-	-	-
131	IA	700-131	Radioactive Site - 700 Area Site #1	HRR <sup>1</sup>	-	-	-
132	IA	700-132	Radioactive Site - 700 Area Site #4	HRR <sup>1</sup>	Annual 1996 <sup>2</sup> (000-121) Annual 1997 <sup>3</sup>	-	-
137	IA	700-137	Cooling Tower Blowdown Buildings 712 and 713 (IAG Name Cooling Tower Blowdown Building 774)	HRR <sup>1</sup>	-	-	-
138	IA	700-138	Cooling Tower Blowdown Building 779	HRR <sup>1</sup>	-	-	-
139 1N(a)	IA	700-139 1N(a)	Caustic/Acid Spills Hydroxide Tank Area	HRR <sup>1</sup>	Annual 1999 <sup>23</sup>	-	-
139 1N(b)	IA	700-139 1N(b)	Caustic/Acid Spills Hydroxide Tank Area	HRR <sup>1</sup>			
139 1S	IA	700-139 1S	Caustic/Acid Spills Hydroxide Tank Area	HRR <sup>1</sup>			
139 2	IA	700-139 2	Caustic/Acid Spills Hydrofluoric Acid Tanks	HRR <sup>1</sup>	-	-	-
143	IA	700-143	Bldg 771 Outfall	HRR <sup>1</sup>	Annual 1997 <sup>3</sup>	-	-
144	IA	700-144(N)	Sewer Line Overflow (IAG Name Sewer Line Break)	HRR <sup>1</sup>	-	-	-
144	IA	700-144(S)	Sewer Line Overflow (IAG Name Sewer Line Break)	HRR <sup>1</sup>	-	-	-
146 1	IA	700-146 1	Concrete Process Waste Tanks 7,500 Gallon Tank (31)	HRR <sup>1</sup>	-	-	-

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**Appendix 1. HRR Sites at RFETS**

IHSS	OU	PAC	Description	Identified	Updated	Proposed NFA	NFA Recommendation Approved
146 2	IA	700-146 2	Concrete Process Waste Tanks 7,500 Gallon Tank (32)	HRR <sup>1</sup>	-	-	-
146 3	IA	700-146 3	Concrete Process Waste Tanks 7,500 Gallon Tank (34W)	HRR <sup>1</sup>	-	-	-
146 4	IA	700-146 4	Concrete Process Waste Tanks 7,500 Gallon Tank (34E)	HRR <sup>1</sup>	-	-	-
146 5	IA	700-146 5	Concrete Process Waste Tanks 3,750 Gallon Tank (30)	HRR <sup>1</sup>	-	-	-
146 6	IA	700-146 6	Concrete Process Waste Tanks 3,750 Gallon Tank (33)	HRR <sup>1</sup>	-	-	-
147 1	IA	700-147 1	Process Waste Line Leaks (IAG Name Maas Area)	HRR <sup>1</sup>	-	-	-
149 1	IA	700-149 1	Effluent Pipe	HRR <sup>1</sup>			
149 2	IA	700-149 2	Effluent Pipe	HRR <sup>1</sup>	-	-	-
150 1	IA	700-150 1	Radioactive Site North of Building 771 (IAG Name Radioactive Leak North of Building 771)	HRR <sup>1</sup>	-	-	-
150 2	IA	700-150 2	Radioactive Site West of Buildings 771 and 776 (IAG Name Radioactive Leak West of Building 771)	HRR <sup>1</sup>	-	-	-
150 3	IA	700-150 3	Radioactive Site Between Buildings 771 & 774 (IAG Name Radioactive Leak Between Buildings 771 & 774)	HRR <sup>1</sup>	-	-	-
150 4	IA	700-150 4	Radioactive Site Northwest of Building 750 (IAG Name Radioactive Leak East of Building 750)	HRR <sup>1</sup>	-	-	-

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Appendix 1. HRR Sites at RFETS						
IHSS	OU	PAC	Description	Identified	Updated	Proposed NFA Recommendation Approved
150 5	IA	700-150 5	Radioactive Site West of Building 707 (IAG Name Radioactive Leak West of Building 707)	HRR <sup>1</sup>	Annual 1998 <sup>7</sup>	Annual 1998 <sup>7</sup>
150 6	IA	700-150 6	Radioactive Site South of Building 779 (IAG Name Radioactive Leak South of Building 779)	HRR <sup>1</sup>	-	-
150 7	IA	700-150 7	Radioactive Site South of Building 776 (IAG Name Radioactive Leak South of Building 776)	HRR <sup>1</sup>	-	-
150 8	IA	700-150 8	Radioactive Site Northeast of Building 779 (IAG Name Radioactive Leak Northeast of Building 779)	HRR <sup>1</sup>	-	-
163 1	IA	700-163 1	Radioactive Site 700 Area Site No 3 Wash Area	HRR <sup>1</sup>	-	-
163 2	IA	700-163 2	Radioactive Site 700 Area Site No 3 Buried Slab	HRR <sup>1</sup>	-	-
185	16	700-185	Solvent Spill	HRR <sup>1</sup>	Annual 1996 <sup>2</sup>	OU 16 CAD/ROD <sup>12</sup>
194	16	700-194	Steam Condensate Leak	HRR <sup>1</sup>	Annual 1996 <sup>2</sup>	OU 16 CAD/ROD <sup>12</sup>
214	IA	700-214	750 Pad Pondcrete & Saltcrete Storage, Unit 25	HRR <sup>1</sup>	-	-
215	IA	700-215	Process Waste Tank Unit 55 13	HRR <sup>1</sup>	-	-
NA	IA	700-1100	French Drain North of Building 776/777	HRR <sup>1</sup>	-	-
NA	IA	700-1101	Laundry Tank Overflow - Building 732	HRR <sup>1</sup>	-	-
NA	IA	700-1102	Transformer Leak - 776-4	HRR <sup>1</sup>	Annual 1996 <sup>2</sup> Annual 1997 <sup>3</sup> Annual 2000 <sup>26</sup> Annual 2001	Annual 1997 <sup>3</sup> Annual 2001
NA	IA	700-1103	Leaking Transformers - Building 707	HRR <sup>1</sup>	Annual 1996 <sup>2</sup>	Annual 1996 <sup>2</sup>
NA	IA	700-1104	Leaking Transformers - Building 708	HRR <sup>1</sup>	Annual 1996 <sup>2</sup>	Annual 1996 <sup>2</sup>
NA	IA	700-1105	Transformer Leak - 779-1/779-2	HRR <sup>1</sup>	-	-

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**Appendix 1. HRR Sites at RFETS**

IHSS	OU	PAC	Description	Identified	Updated	Proposed NFA	NFA Recommendation Approved
NA	IA	700-1106	Process Waste Spill - Portal 1	HRR <sup>1</sup>	-	Annual 2002	-
NA	IA	700-1107	Compressor Waste Oil Spill - Building 776	HRR <sup>1</sup>	-	-	EPA, 1992 <sup>4</sup> 2002 <sup>12</sup>
NA	IA	700-1108	771/774 Footing Drain Pond	HRR <sup>1</sup>	Annual 1999 <sup>21</sup>	-	-
NA	IA	700-1109	Uranium Incident - Building 778	HRR <sup>1</sup>	-	-	EPA, 1992 <sup>4</sup> 2002 <sup>12</sup>
NA	IA	700-1110	Nickel Carbonyl Burial West of Building 771	HRR <sup>1</sup>	-	-	EPA 1992 <sup>4</sup> 2002 <sup>14</sup>
NA	IA	700-1111	Leaking Transformer - Building 750	HRR <sup>1</sup>	Annual 1996 <sup>2</sup>	Annual 1996 <sup>2</sup>	-
NA	IA	700-1112	Leaking Transformer - 776-5	HRR <sup>1</sup>	Annual 1996 <sup>2</sup>	Annual 1996 <sup>2</sup>	-
101	IA	700-1113	Water Released from 207C Solar Evaporation Pond	Quarterly 11 <sup>18</sup>	-	Quarterly 11 <sup>18</sup>	2002 <sup>14</sup>
NA	IA	700-1114a	Release During Liquid Transfer Operations from Bldg 774	Annual 1997 <sup>3</sup>	-	Annual 1997 <sup>3</sup>	2002 <sup>14</sup>
NA	IA	700-1114b	Release During Liquid Transfer Operations from Bldg 774	Annual 1997 <sup>3</sup>	Annual 2002 <sup>35</sup>	Annual 1997 <sup>3</sup>	2002 <sup>34</sup>
NA	IA	700-1115	Identification of Diesel Fuel in Subsurface Soils	Annual 1997 <sup>3</sup>	-	-	-
150 7	IA	700-1116	Leaking Transformer South of Building 776	Annual 1998 <sup>7</sup>	-	-	-
NA	IA	700-1117	Building 701 Water Line, Soil Put-back	Annual 1998 <sup>7</sup>	-	Annual 1998 <sup>7</sup>	CDPHE 1998 <sup>19</sup>
<b>800 AREA</b>							
102	1	800-102	Oil Sludge Pit	HRR <sup>1</sup>	Annual 1997 <sup>3</sup>	-	OU I CAD/ROD <sup>20</sup>



**Appendix 1. HRR Sites at RFETS**

IHSS	OU	PAC	Description	Identified	Updated	Proposed NFA	NFA Recommendation Approved
103	1	800-103	Chemical Burial	HRR <sup>1</sup>	Annual 1997 <sup>3</sup>	-	OU 1 CAD/ROD <sup>20</sup>
104	1	800-104	Liquid Dumping	HRR <sup>1</sup>	Annual 1997 <sup>3</sup>	-	OU 1 CAD/ROD <sup>20</sup>
105 1	1	800-105 1	Bldg 881 Westernmost Out of Service Fuel Tanks	HRR <sup>1</sup>	Annual 1997 <sup>3</sup>	-	OU 1 CAD/ROD <sup>20</sup>
105 2	1	800-105 2	Bldg 881 Easternmost Out of Service Fuel Tanks	HRR <sup>1</sup>	Annual 1997 <sup>3</sup>	-	OU 1 CAD/ROD <sup>20</sup>
106	1	800-106	Bldg 881, Outfall	HRR <sup>1</sup>	Annual 1997 <sup>3</sup>	-	OU 1 CAD/ROD <sup>20</sup>
107	1	800-107	Bldg 881, Hillside Oil Leak	HRR <sup>1</sup>	Annual 1997 <sup>3</sup>	-	OU 1 CAD/ROD <sup>20</sup>
145	1	800-145	Sanitary Waste Line Leak	HRR <sup>1</sup>	Annual 1997 <sup>3</sup>	-	OU 1 CAD/ROD <sup>20</sup>
147 2	IA	800-147 2	Bldg Conversion Activity Contamination Area	HRR <sup>1</sup>	Annual 1997 <sup>3</sup>	Annual 1997 <sup>1</sup>	1999 <sup>27</sup>
164 2	IA	800-164 2	Radioactive Site 800 Area Site #2, Building 886 Spills	HRR <sup>1</sup>	-	-	-
164 3	IA	800-164 3	Radioactive Site 800 Area Site #2, Building 889 Storage Pad	HRR <sup>1</sup>	-	-	-
177	IA	800-177	Building 885 Drum Storage and Paint Storage (IAG Name Building 885 Drum Storage Area)	HRR <sup>1</sup>	-	-	-
178	15	800-178	Building 881 Drum Storage Area	HRR <sup>1</sup>	Annual 1996 <sup>2</sup>	-	OU 15 CAD/ROD <sup>21</sup>
179	15	800-179	Building 865 Drum Storage, refer to OU 15 CAD/ROD)	HRR <sup>1</sup>	Annual 1996 <sup>2</sup> Annual 2001	Annual 1996 <sup>2</sup> Annual 2001	2002 <sup>32</sup>
180	15	800-180	Building 883 Drum Storage, refer to OU 15 CAD/ROD)	HRR <sup>1</sup>	Annual 1996 <sup>2</sup> Annual 2001	Annual 1996 <sup>2</sup> Annual 2001	2002 <sup>32</sup>
211	15	800-211	Building 881 Drum Storage, Unit 26	HRR <sup>1</sup>	Annual 1996 <sup>2</sup>	-	OU 15 CAD/ROD <sup>22</sup>
217	15	800-217	Building 881, CN Bench Scale Treatment, Unit 32	HRR <sup>1</sup>	Annual 1996 <sup>2</sup>	-	OU 15 CAD/ROD <sup>22</sup>
NA	IA	800-1200	Valve Vault 2	HRR <sup>1</sup>	-	-	-

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**Appendix 1. HRR Sites at RFETS**

IHSS	OU	PAC	Description	Identified	Updated	Proposed NFA	NFA Recommendation Approved
NA	IA	800-1201	Radioactive Site South of Building 883	HRR <sup>1</sup>	-	-	-
NA	IA	800-1202	Sulfuric Acid Spill, Building 883	HRR <sup>1</sup>	-	-	EPA, 1992 <sup>4</sup> 2002 <sup>32</sup>
NA	IA	800-1203	Sanitary Sewer Line Break Between Buildings 865 and 886	HRR <sup>1</sup>	-	-	EPA, 1992 <sup>4</sup> 2002 <sup>32</sup>
NA	IA	800-1204	Building 866 Spills	HRR <sup>1</sup>	-	-	-
NA	IA	800-1205	Building 881, East Dock	HRR <sup>1</sup>	-	-	-
NA	IA	800-1206	Fire, Building 883	HRR <sup>1</sup>	-	-	EPA, 1992 <sup>4</sup> 2002 <sup>32</sup>
NA	IA	800-1207	Transformer 883-4	HRR <sup>1</sup>	Annual 1996 <sup>2</sup>	Annual 1996 <sup>2</sup>	-
NA	IA	800-1208	Transformer 881-4	HRR <sup>1</sup>	Annual 1996 <sup>2</sup>	Annual 1996 <sup>2</sup>	-
NA	IA	800-1209	Leaking Transformers, 800 Area	HRR <sup>1</sup>	Annual 1996 <sup>2</sup>	Annual 1996 <sup>2</sup>	-
NA	IA	800-1210	Transformers 865-1 and 865-2	HRR <sup>1</sup>	Annual 1996 <sup>2</sup>	Annual 1996 <sup>2</sup>	-
NA	IA	800-1211	Capacitor Leak, Building 883	HRR <sup>1</sup>	-	-	EPA, 1992 <sup>4</sup> 2002 <sup>32</sup>
NA	IA	800-1212	Building 866 Sump Spill	Quarterly 5 <sup>10</sup>	-	-	-
<b>900 AREA</b>							
108	BZ	900-108	Trench T-1	HRR <sup>1</sup>	Annual 1997 <sup>3</sup> Annual 1998 <sup>7</sup> Annual 2000 <sup>26</sup>	Annual 1999 <sup>23</sup> Annual 2000 <sup>26</sup>	2001 <sup>31</sup> 2002 <sup>32</sup>

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**Appendix 1. HRR Sites at RFETS**

IHSS	OU	PAC	Description	Identified	Updated	Proposed NFA	NFA Recommendation Approved
109	BZ	900-109	Trench T-2 - Ryan's Pit	HRR <sup>1</sup>	Annual 1996 <sup>2</sup> Annual 1997 <sup>3</sup> Annual 2002 <sup>35</sup>	Annual 1997 <sup>3</sup>	2002 <sup>34</sup>
112	BZ	900-112	903 Pad (IAG Name 903 Drum Storage Area)	HRR <sup>1</sup>	Annual 1997 <sup>3</sup> Annual 1998 <sup>7</sup> Annual 1999 <sup>23</sup> Annual 2000 <sup>26</sup>	-	-
113	BZ	900-113	Mound Area	HRR <sup>1</sup>	Annual 1997 <sup>3</sup>	Annual 1997 <sup>3</sup>	1999 <sup>27</sup>
119 1	1	900-119 1	West Scrap Metal Storage Area and Solvent Spill (OU 1 CAD/ROD Specifies Continuance of Groundwater Collection from well (see ref # 20))	HRR <sup>1</sup>	Annual 1996 <sup>2</sup> Annual 1997 <sup>3</sup> Annual 1998 <sup>7</sup>	-	1999 <sup>27</sup>
119 2	1	900-119 2	East Scrap Metal Storage Area and Solvent Spill	HRR <sup>1</sup>	Annual 1996 <sup>2</sup> Annual 1997 <sup>3</sup>	-	OU 1 CAD/ROD <sup>20</sup>
130	1	900-130	Contaminated Soil Disposal Area East of Bldg 881	HRR <sup>1</sup>	Annual 1997 <sup>3</sup>	-	OU 1 CAD/ROD <sup>20</sup>
140	BZ	900-140	Hazardous Disposal Area (IAG Name Reactive Metal Destruction Site)	HRR <sup>1</sup>	Annual 1997 <sup>3</sup> Annual 1998 <sup>7</sup> Annual 2000 <sup>26</sup>	Annual 1998 <sup>7</sup>	-
141	6	900-141	Sludge Disposal	HRR <sup>1</sup>	Annual 1997 <sup>3</sup>	Annual 1997 <sup>3</sup>	1999 <sup>27</sup>
153	IA	900-153	Oil Burn Pit No 2	HRR <sup>1</sup>	Annual 1999 <sup>23</sup>	-	-
154	IA	900-154	Pallet Burn Site	HRR <sup>1</sup>	Annual 1999 <sup>23</sup>	-	-

**Appendix 1. HRR Sites at RFETS**

<b>IHSS</b>	<b>OU</b>	<b>PAC</b>	<b>Description</b>	<b>Identified</b>	<b>Updated</b>	<b>Proposed NFA</b>	<b>NFA Recommendation Approved</b>
155	BZ	900-155	903 Lip Area	HRR <sup>1</sup>	Annual 1997 <sup>3</sup> Annual 1998 <sup>7</sup> Annual 1999 <sup>23</sup> Annual 2000 <sup>26</sup>	-	-
165	IA	900-165	Triangle Area	HRR <sup>1</sup>	-	-	-
173	IA	900-173	South Dock - Building 991 (IAG Name Radioactive Site - 900 Area)	HRR <sup>1</sup>	-	-	-
175	IA	900-175	S&W Building 980 Container Storage Facility	HRR <sup>1</sup>	-	-	-
176	IA	900-176	S&W Contractor Storage Yard	HRR <sup>1</sup>	-	-	-
183	BZ	900-183	Gas Detoxification Area	HRR <sup>1</sup>	Annual 1997 <sup>3</sup> Annual 2000 <sup>26</sup> Annual 2002 <sup>35</sup>	Annual 1997 <sup>3</sup> Annual 2000 <sup>26</sup>	2001 <sup>31</sup> 2002 <sup>32</sup>
184	IA	900-184	Building 991 Steam Cleaning Area	HRR <sup>1</sup>	-	-	-
210	IA	900-210	Building 980 Cargo Container, Unit 16	HRR <sup>1</sup>	Annual 1997 <sup>3</sup>	Annual 1997 <sup>3</sup>	1999 <sup>27</sup>
213	IA	900-213	Unit 15, 904 Pad Pondcrete Storage	HRR <sup>1</sup>	-	-	-
NA	IA	900-1300	RO Plant Sludge Drying Beds	HRR <sup>1</sup>	-	-	EPA, 1992 <sup>4</sup> 2002 <sup>34</sup>
NA	IA	900-1301	Building 991 Enclosed Area	HRR <sup>1</sup>	-	-	-
NA	IA	900-1302	Gasoline Spill	HRR <sup>1</sup>	-	-	EPA, 1992 <sup>4</sup> 2002 <sup>32</sup>
NA	IA	900-1303	Natural Gas Leak	HRR <sup>1</sup>	-	-	EPA 1992 <sup>4</sup> 2002 <sup>32</sup>

**Appendix 1. HRR Sites at RFETS**

IHSS	OU	PAC	Description	Identified	Updated	Proposed NFA	NFA Recommendation Approved
NA	IA	900-1304	Chromic Acid Spill - Building 991	HRR <sup>1</sup>	-	-	EPA, 1992 <sup>4</sup> 2002 <sup>12</sup>
NA	IA	900-1305	Building 991 Roof	HRR <sup>1</sup>	-	-	EPA, 1992 <sup>4</sup> 2002 <sup>12</sup>
NA	IA	900-1306	Transformers 991-1 and 991-2	HRR <sup>1</sup>	Annual 1996 <sup>2</sup>	Annual 1996 <sup>2</sup>	-
NA	IA	900-1307	Explosive Bonding Pit	HRR <sup>1</sup>	Annual 1999 <sup>2,3</sup>	-	-
NA	IA	900-1308	Gasoline Spill Outside of Building 980	Quarterly 6 <sup>16</sup>	Quarterly 8 <sup>15</sup> Annual 2001	Annual 2001	2002 <sup>12</sup>
NA	BZ	900-1309	OU 2 Field Treatability Unit Spill	Quarterly 6 <sup>16</sup>	Quarterly 7 <sup>9</sup> (900-1312) Quarterly 8 <sup>15</sup> Annual 1999 <sup>23</sup>	Annual 1999 <sup>23</sup>	2000 <sup>29</sup>
NA	IA	900-1310	ITS Water Spill (identified as 000-502 in Quarterly 2, reassigned 900-1310 in Quarterly 7 <sup>9</sup> )	Quarterly 2 <sup>5</sup>	Quarterly 3 <sup>6</sup> Quarterly 7 <sup>9</sup>	-	-
NA	IA	900-1311	Septic Tank East of Building 991	Quarterly 7 <sup>9</sup>	Annual 1999 <sup>23</sup> Annual 2000 <sup>26</sup>	Annual 1999 <sup>23</sup> Annual 2000 <sup>26</sup>	2001 <sup>31</sup> 2002 <sup>32</sup>
NA	IA	900-1312	OU-2 Water Spill	Quarterly 7 <sup>9</sup>	Annual 1999 <sup>23</sup>	Annual 1999 <sup>23</sup>	1999 <sup>29</sup>
192	IA	900-1313	Seep Area Near OU-2 Influent	Quarterly 9 <sup>11</sup>	Annual 1999 <sup>23</sup>	Annual 1999 <sup>23</sup>	1999 <sup>29</sup>
101	IA	900-1314	Solar Evaporation Pond 207B Sludge Release	Quarterly 9 <sup>13</sup>	-	Quarterly 9 <sup>13</sup>	2002 <sup>14</sup>
NA	IA	900-1315	Tanker Truck Release on East Patrol Road, North of Spruce Ave	Quarterly 10 <sup>11</sup>	Quarterly 11 <sup>18</sup>	Quarterly 11 <sup>18</sup>	2002 <sup>14</sup>

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**Appendix 1. HRR Sites at RFETS**

IHSS	OU	PAC	Description	Identified	Updated	Proposed NFA	NFA Recommendation Approved
NA	BZ	900-1316	Elevated Chromium (total) Identified During Geotechnical Drilling	Quarterly 10 <sup>11</sup>	-	Quarterly 10 <sup>11</sup>	2002 <sup>14</sup>
176	IA	900-1317	Soil Released from Wooden Crate in 964 Laydown Yard	Quarterly 11 <sup>18</sup>	-	Quarterly 11 <sup>18</sup>	2002 <sup>14</sup>
NA	IA	900-1318	Release of F001 Listed Waste Water to Soil (identified as 900-1307 in Annual 1997, reassigned 900-1318 in Annual 1998)	Annual 1997 <sup>3</sup>	Annual 1998 <sup>7</sup> Annual 2000 <sup>26</sup>	Annual 1997 <sup>3</sup> Annual 2000 <sup>26</sup>	2001 <sup>31</sup> 2002 <sup>32</sup>
<b>OFF-SITE AREA</b>							
199	3	OFF-SITE AREA 1	Off-Site Area 1	HRR <sup>1</sup>	Annual 1997 <sup>3</sup>	-	OU 3 CAD/ROD <sup>22</sup>
200	3	OFF-SITE AREA 2	Great Western Reservoir	HRR <sup>1</sup>	Annual 1997 <sup>3</sup>	-	OU 3 CAD/ROD <sup>22</sup>
201	3	OFF-SITE AREA 3	Standley Lake	HRR <sup>1</sup>	Annual 1997 <sup>3</sup>	-	OU 3 CAD/ROD <sup>22</sup>
202	3	OFF-SITE AREA 4	Mower Reservoir	HRR <sup>1</sup>	Annual 1997 <sup>3</sup>	-	OU 3 CAD/ROD <sup>22</sup>
<b>UNDER BUILDING CONTAMINATION</b>							
NA	IA	UBC-122	Building 122 (UBC-122)	HRR <sup>1</sup>	-	-	-
NA	IA	UBC-123	Building 123 (UBC-123)	HRR <sup>1</sup>	Annual 1998 <sup>7</sup> Annual 2001	Annual 2002	-
NA	IA	UBC-125	Building 125 (UBC-125)	HRR <sup>1</sup>	Annual 2002 <sup>15</sup>	-	2002 <sup>11</sup>
NA	IA	UBC-331	Building 331 (UBC-331)	HRR <sup>1</sup>	-	-	-
NA	IA	UBC-371	Building 371 (UBC-371)	HRR <sup>1</sup>	-	-	-
NA	IA	UBC-374	Building 374 (UBC-374)	HRR <sup>1</sup>	-	-	-
NA	IA	UBC-439	Building 439 (UBC-439)	HRR <sup>1</sup>	-	-	-

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**Appendix 1. HRR Sites at RFETS**

IHSS	OU	PAC	Description	Identified	Updated	Proposed NFA	NFA Recommendation Approved
NA	IA	UBC-440	Building 440 (UBC-440)	HRR <sup>1</sup>	-	-	-
NA	IA	UBC-441	Building 441 (UBC-441)	HRR <sup>1</sup>	-	-	-
NA	IA	UBC-442	Building 442 (UBC-442)	HRR <sup>1</sup>	-	-	-
NA	IA	UBC-444	Building 444 (UBC-444)	HRR <sup>1</sup>	-	-	-
NA	IA	UBC-447	Building 447 (UBC-447)	HRR <sup>1</sup>	-	-	-
NA	IA	UBC-528	Building 528 (UBC-528)	HRR <sup>1</sup>	-	-	-
NA	IA	UBC-559	Building 559 (UBC-559)	HRR <sup>1</sup>	-	-	-
NA	IA	UBC-701	Building 701 (UBC-701)	HRR <sup>1</sup>	-	-	-
NA	IA	UBC-707	Building 707 (UBC-707)	HRR <sup>1</sup>	-	-	-
NA	IA	UBC-731	Building 731 (UBC-731)	HRR <sup>1</sup>	-	-	-
NA	IA	UBC-770	Building 770 (UBC-770)	HRR <sup>1</sup>	-	-	-
NA	IA	UBC-771	Building 771 (UBC-771)	HRR <sup>1</sup>	Annual 2001	-	-
NA	IA	UBC-774	Building 774 (UBC-774)	HRR <sup>1</sup>	-	-	-
NA	IA	UBC-776	Building 776 (UBC-776)	HRR <sup>1</sup>	-	-	-
NA	IA	UBC-777	Building 777 (UBC-777)	HRR <sup>1</sup>	-	-	-
NA	IA	UBC-778	Building 778 (UBC-778)	HRR <sup>1</sup>	-	-	-
NA	IA	UBC-779	Building 779 (UBC-779)	HRR <sup>1</sup>	-	-	-
NA	IA	UBC-865	Building 865 (UBC-865)	HRR <sup>1</sup>	-	-	-
NA	IA	UBC-881	Building 881 (UBC-881)	HRR <sup>1</sup>	-	-	-
NA	IA	UBC-883	Building 883 (UBC-883)	HRR <sup>1</sup>	-	-	-
NA	IA	UBC-886	Building 886 (UBC-886)	HRR <sup>1</sup>	Annual 2001	-	-
NA	IA	UBC-887	Building 887 (UBC-887)	HRR <sup>1</sup>	-	-	-

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**Appendix 1. HRR Sites at RFETS**

IHSS	OU	PAC	Description	Identified	Updated	Proposed NFA	NFA Recommendation Approved
NA	IA	UBC-889	Building 889 (UBC-889)	HRR <sup>1</sup>	-	Annual 2002	-
NA	IA	UBC-991	Building 991 (UBC-991)	HRR <sup>1</sup>	-	-	-
NA	NA	NA	PICs 1, 2, 3, 5, 7, 8, 10, 12, 13, 16, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 43, 45, 46, 48, 49, 50, 51, 52, 53, 54, 55, 56, 58, 59, 60, 61	HRR <sup>1</sup>	2002	-	2002 <sup>14</sup>
NA	NA	NA	PICs 4, 6, 9, 11, 14, 15, 17, 18, 41, 42, 44, 47, 57	HRR <sup>1</sup>	2002	-	

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- 1 Historical Release Report for the Rocky Flats Plant, Rocky Flats Plant, Golden, CO, June, 1992
- 2 Annual Update for the Historical Release Report, RF/ER-96-0046, Rocky Flats Environmental Technology Site, Golden, CO, September, 1996
- 3 Annual Update for the Historical Release Report, RF/RMRS-97-073 UN, Rocky Flats Environmental Technology Site, Golden, CO, September, 1997
- 4 EPA, 1992 Correspondence to R. Schassburger, DOE RFO, from M. Hestmark, EPA Region VIII, RE Potential Area of Concern Needing Further Investigation, December 23
- 5 Historical Release Report Second Quarterly Update, October 1, 1992 to January 1, 1993
- 6 Historical Release Report, Third Quarterly Update, January 1, 1993 to April 1, 1993
- 7 Annual Update for the Historical Release Report, RF/RMRS-98-269 UN, Rocky Flats Environmental Technology Site, Golden, CO, September
- 8 Historical Release Report, Fourth Quarterly Update, April 1, 1993 to July 1, 1993
- 9 Historical Release Report, Seventh Quarterly Update, January 1, 1994 to March 31, 1994
- 10 Historical Release Report, Fifth Quarterly Update, July 1, 1993 to October 1, 1993
- 11 Historical Release Report, Tenth Quarterly Update, October 1, 1994 to December 31, 1994
- 12 Corrective Action Decision/Record of Decision for OU 16 Low Priority Sites, Rocky Flats Environmental Technology Site, Golden, CO August, 1994
- 13 Historical Release Report, Ninth Quarterly Update, July 1, 1994 to September 30, 1994
- 14 Operable Unit 11 Final Combined Phases RFI/RI Report, Rocky Flats Environmental Technology Site, Golden, CO, June, 1995
- 15 Historical Release Report, Eighth Quarterly Update, April 1, 1994 to June 30, 1994
- 16 Historical Release Report, Sixth Quarterly Update, October 1, 1993 to January 1, 1994
- 17 Historical Release Report, Twelfth Quarterly Update, April 1, 1995 to June 30, 1995
- 18 Historical Release Report, Eleventh Quarterly Update, January 1, 1995 to March 31, 1995
- 19 CDPHE, 1998, Excavated Soil Adjacent to Building 701 (cc mail from C. Spreng to L. Brooks), Rocky Flats Environmental Technology Site, Golden, CO, July
- 20 Corrective Action Decision/Record of Decision, Operable Unit 1 881 Hillside Area, IHSS 119 1, Department of Energy, Rocky Flats Environmental Technology Site, Golden, CO, February, 1997
- 21 Corrective Action Decision/Record of Decision for OU 15 Inside Building Closures, Rocky Flats Environmental Technology Site, Golden, CO, August, 1995
- 22 Final Corrective Action Decision/Record of Decision Declaration, Operable Unit 3, Department of Energy, Rocky Flats Environmental Technology Site, Golden, CO, July, 1997
- 23 Annual Update for the Historical Release Report, RF/RMRS-99-428 UN, Rocky Flats Environmental Technology Site, Golden, CO, September, 1999
- 24 Historical Release Report, First Quarterly Report submitted September 30, 1992
- 25 KH, 2000, Historical Release Report (Interim Update) and Response to Comments for HRR Annual Updates (1997, 1998 & 1999), Rocky Flats Environmental Technology Site, Golden, CO, September

- 26 Annual Update for the Historical Release Report, KH-00-900 UN, Rocky Flats Environmental Technology Site, Golden, CO, September, 2000
- 27 EPA, CDPHE, 1999 Correspondence to J Legare, DOE RFO, from T Rehder, EPA Region VIII, S Gunderson, CDPHE, RE 1997 Annual HRR Review, July 9, 1999
- 28 EPA, CDPHE, 1999 Correspondence to J Legare, DOE RFO, from T Rehder, EPA Region VIII, S Gunderson, CDPHE, RE 1998 Annual HRR Review, July 9, 1999
- 29 EPA, CDPHE, 2000 Correspondence to J Legare, DOE RFO, from T Rehder, EPA Region VIII, S Gunderson, CDPHE, RE 1999 Annual HRR Review, June 23, 2000
- 30 EPA, CDPHE, 2001 Correspondence to J Legare, DOE RFO, from T Rehder, EPA Region VIII, S Gunderson, CDPHE, RE NFA PAC 100-607, April 12, 2001
- 31 CDPHE, 2001, Preliminary Electronic Correspondence to M C Broussard, from C Spreng CDPHE, RE 2000 Annual HRR Review, September 2001
- 32 EPA, CDPHE, 2002 Correspondence to J Legare, DOE RFO, from T Rehder, EPA Region VIII, S Gunderson, CDPHE, RE Approval of NFA Designation for IHSSs, & PACs, February 14, 2002
- 33 EPA, CDPHE, 2002 Correspondence to J Legare, DOE RFO, from T Rehder, EPA Region VIII, S Gunderson, CDPHE, RE No Further Action Justification for Bldg 125 UBC, April 2, 2002
- 34 EPA, CDPHE, 2002 Correspondence to J Legare, DOE RFO, from T Rehder, EPA Region VIII, S Gunderson, CDPHE, RE Approval of NFA designation for IHSSs, PACs, and PICs, September 26, 2002
- 35 Additional clarification supporting NFA status is provided in the 2002 HRR narratives, based on discussions of FY02 HRR Working Group
- 36 Further clarification of NFA status is provided by NFA Approval Letter, based on FY02 HRR Working Group discussion

## **Appendix 2**

# **Correspondence**

CORRES CONTROL  
INCOMING LTR NO

00120RFC2

DUE DATE  
ACTIONColorado Department  
of Public Health  
and Environment

RECEIVED

2002 FEB 26 A 9 31

CORRESPONDENCE  
CONTROL

DIST	LTR	ENC
BOGENBERGER, V.		
BOGNAR, E.	X	X
BRALSFORD, M.D.		
BURNS, T. F.		
DECK, C. A.	X	X
DEGENHART, K.		
DIETHELM, S. E.		
FERRERA, D.W.		
FERRI, M.S.		
GERMAN, A. L.		
GIACOMINI, J.		
HALL, I.		
ISOM, J. H.		
MARTINEZ, L.A.	X	X
NORTH, K.	X	X
PARKER, A.M.		
POWERS, K.		
RAAZ, R. D.		
RODGERS, A. D.		
SCOTT, G.K.		
SHELTON, D.C.	X	X
SPEARS, M.S.		
TRICE, K.D.		
TUOR, N.R.		
VOORHEES, G.M.		
WILLIAMS, J. L.		
SUTLER, L.	X	X
Broussard, M.	X	X
McLaughlin, J.	X	X
Rosenman, A.	X	X

JOB CONTROL	X	X
ADMIN RECORD		
ATS/130		

Reviewed for Addressee  
Corres Control RFP

3/26/02 By [Signature]

Ref Ltr #

JOE ORDER #

54001

February 14, 2002

Joe Legare

Assistant Administrator for Environment and Infrastructure

U S Department of Energy-RFFO

10808 Highway 93, Unit A

Golden CO 80401-8200

RE Approval of NFA designation for IHSSs and PACs

Dear Mr Legare

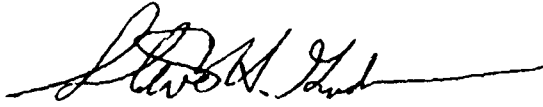
Since 1994 the Site has been proposing IHSSs and PACs for No Further Action (NFA) or No Further Remedial Action (NFRA) in the annual and quarterly Updates to the Historic Release Reports (HRR). No formal process was in place for the agencies to disposition the proposed NFA/NFRA sites. This fall an NFA Working Group developed and implemented a systematic approach for reviewing NFA/NFRA proposals in accordance with RFCA Attachment 6 and the Implementation Guidance Document. Using this systematic approach, 79 proposed sites were discussed during November and December 2001. It was agreed that 63 of the 79 sites meet the criteria for NFA/NFRA sites. This letter provides formal approval of these 63 sites listed in the attached table (Table 1). The remaining sixteen sites either require additional information, additional characterization, or limited remediation prior to approval as NFA/NFRA sites. Approved meeting minutes are located in the Site Project File and provide a record of discussions and agreements reached among the NFA Working Group members.

NFA meeting discussions also resulted in several corrections or clarifications to previous HRR Updates and associated correspondence. Some of the items are significant enough that they will be addressed in the 2002 Annual HRR Update. Other items only require documentation here in order to complete the process. Table 2 describes these clarifications and corrections.

If you have any questions please contact Gary Kleeman (EPA), 303-312-6246, Carl Spreng (CDPHE), 303-692-3358 or Reginald Tyler (DOE), 303-966-5927.

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Sincerely,



Steven H Gunderson  
RFCA Project Coordinator  
Colorado Department of Public  
Health and Environment



Tim Rehder  
Rocky Flats Project Manager  
Environmental Protection Agency

Enclosure

cc w/Enc

L Butler, KH

M Broussard, KH

R Tyler, ERWM, RFFO

G Kleeman, EPA

C Spreng, CDPHE

**List of Recently Approved NFAs**  
**Table 1**

IHSS	OU	PAC	DESCRIPTION	IDENTIFIED	UPDATED	APPROVED	NOTES
133 3	5	SW-133 3	Ash Pit 3	HRR <sup>1</sup>	Annual 2001	12/5/01	
NA	5	SW-1701	Recently Identified Ash Pit (also referred to as TDEM-1)	Quarterly 9 <sup>13</sup>	Annual 1997 <sup>3</sup> Annual 2001	12/5/01	
NA	1A	400-812	Tank T-2 Spill in Building 460	Quarterly 6 <sup>16</sup>	Quarterly 7 <sup>9</sup> Quarterly 8 <sup>15</sup> Annual 2001	12/19/01	
179	15	800-179	Building 865 Drum Storage	HRR <sup>1</sup>	Annual 1996 <sup>2</sup> Annual 2001	12/19/01	
180	15	800-180	Building 883 Drum Storage	HRR <sup>1</sup>	Annual 1996 <sup>2</sup> Annual 2001	12/19/01	
NA	1A	900-1308	Gasoline Spill Outside of Building 980	Quarterly 6 <sup>16</sup>	Quarterly 8 <sup>15</sup> Annual 2001	12/19/01	
NA	BZ	NE-1409	Modular Tanks and 910 Treatment System Spill (formerly 000-503)	Quarterly 5 <sup>10</sup>	Quarterly 7 <sup>9</sup> Annual 2000 <sup>26</sup>	11/14/01	
156 1	1A	300-156 1	Building 371 Parking Lot (2 locations designated on Plate #2)	HRR <sup>1</sup>	Annual 1997 <sup>3</sup> Annual 2000 <sup>26</sup>	11/14/01	

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*List of Recently Approved NFAs*  
*Table 1*

IHSS	OU	PAC	DESCRIPTION	IDENTIFIED	UPDATED	APPROVED	NOTES
123 1	IA	700-123 1	Valve Vault 7	HRR <sup>1</sup>	Annual 1997 <sup>3</sup> Annual 2000 <sup>26</sup>	11/14/01	
108	BZ	900-108	Trench T-1	HRR <sup>1</sup>	Annual 1997 <sup>3</sup> Annual 1998 <sup>7</sup> Annual 2000 <sup>26</sup>	11/14/01	
NA	IA	900-1311	Septic Tank East of Building 991	Quarterly 7 <sup>9</sup>	Annual 1999 <sup>23</sup> Annual 2000 <sup>26</sup>	11/14/01	
NA	IA	900-1318	Release of F001 Listed Waste Water to Soil (identified as 900-1307 in Annual 1997, reassigned 900-1318 in Annual 1998)	Annual 1997 <sup>3</sup>	Annual 1998 <sup>7</sup> Annual 2000 <sup>26</sup>	11/14/01	

**List of Recently Approved NFAs**  
**Table 1**

IHSS	OU	PAC	DESCRIPTION	IDENTIFIED	UPDATED	APPROVED	NOTES
166 1	6	NE-166 1	Trench A	HRR <sup>1</sup>	Annual 1996 <sup>2</sup>	11/14/01	
166 2	6	NE-166 2	Trench B	HRR <sup>1</sup>	Annual 1996 <sup>2</sup>	11/14/01	
166 3	6	NE-166 3	Trench C	HRR <sup>1</sup>	Annual 1996 <sup>2</sup>	11/14/01	
167 2	7	NE-167 2	Pond Area Spray Field (Center Area)	HRR <sup>1</sup>	Annual 1996 <sup>2</sup>	11/14/01	
167 3	7	NE-167 3	South Area Spray Field	HRR <sup>1</sup>	Annual 1996 <sup>2</sup>	11/14/01	
216 1	6	NE-216 1	East Spray Fields - North Area	HRR <sup>1</sup>	Annual 1996 <sup>2</sup>	11/14/01	
204	15	400-204	Original Uranium Chip Roaster	HRR <sup>1</sup>	Annual 1996 <sup>2</sup>	11/14/01	
158	1A	500-909	Release of Spent Photographic Fixer Solution	Annual 1996 <sup>2</sup>	-	11/14/01	
<b>Quarterly HRR Update 7</b>							
114	7	NW-1502	Improper Disposal of Diesel-Contaminated Material at Landfill (formerly NW-177)	Quarterly 2 <sup>5</sup>	Quarterly 3 <sup>6</sup> Quarterly 7 <sup>9</sup>	12/19/01	



**List of Recently Approved NFAs**  
**Table 1**

IHSS	OU	PAC	DESCRIPTION	IDENTIFIED	UPDATED	APPROVED	NOTES
114	7	NW-1503	Improper Disposal of Fuel Contaminated Material at Landfill	Quarterly 1 <sup>24</sup>	Quarterly 7 <sup>9</sup>	12/19/01	
Site Approved by EPA in 1992, withing CDPHE jurisdiction.							
NA	BZ	NE-1400	Tear Gas Powder Release	HRR <sup>1</sup>	-	12/19/01	
NA	BZ	NE-1401	NE Buffer Zone Gas Line Break	HRR <sup>1</sup>	-	11/14/01	
NA	BZ	NE-1402	East Inner Gate PCB Spill	HRR <sup>1</sup>	-	11/14/01	
NA	BZ	NE-1403	Gasoline Spill - Building 920 Guard Post	HRR <sup>1</sup>	-	11/14/01	
NA	BZ	SW-1700	Fuel Spill into Woman Creek Drainage	HRR <sup>1</sup>	-	11/14/01	
NA	BZ	000-501	Roadway Spraying	HRR <sup>1</sup>	-	12/19/01	
NA	IA	100-600	Mercury Spill - Valve Vault 124-B, Building 124	HRR <sup>1</sup>	-	12/19/01	
NA	IA	100-601	Building 123 Phosphoric Acid Spill	HRR <sup>1</sup>	-	11/14/01	
NA	IA	100-604	T130 Complex Sewer Line Leaks	HRR <sup>1</sup>	-	11/14/01	

*List of Recently Approved NFAs*  
*Table 1*

IHSS	OU	PAC	DESCRIPTION	IDENTIFIED	UPDATED	APPROVED	NOTES
NA	IA	100-605	Building 115 Hydraulic Oil Spill	HRR <sup>1</sup>	-	11/14/01	
NA	IA	100-606	Building 125 TCE Spill	HRR <sup>1</sup>	-	11/14/01	
NA	IA	100-610	Asbestos Release - Building 123	HRR <sup>1</sup>	-	11/14/01	
NA	IA	100-612	Battery Solution Spill - Building 119	HRR <sup>1</sup>	-	11/14/01	
NA	IA	300-700	Scrap Roofing Disposal	HRR <sup>1</sup>	-	11/14/01	
NA	IA	300-701	Sulfuric Acid Spill - Building 371	HRR <sup>1</sup>	-	11/14/01	
NA	IA	300-703	Building 331 North Area	HRR <sup>1</sup>	-	11/14/01	
NA	IA	300-704	Roof Fire, Building 381	HRR <sup>1</sup>	-	11/14/01	
NA	IA	300-705	Potassium Hydroxide Spill North of Building 374	HRR <sup>1</sup>	-	11/14/01	
NA	IA	300-706	Evaporator Tanks North of Building 374	HRR <sup>1</sup>	-	11/14/01	

**List of Recently Approved NFAs**  
**Table 1**

IHSS	OU	PAC	DESCRIPTION	IDENTIFIED	UPDATED	APPROVED	NOTES
NA	1A	300-707	Sanitizer Spill	HRR <sup>1</sup>	-	12/19/01	
NA	1A	300-710	Gasoline Spill North of Building 331	HRR <sup>1</sup>	-	11/14/01	
NA	1A	400-805	Building 443 Tank #9 Leak	HRR <sup>1</sup>	-	12/5/01	
NA	1A	400-806	Catalyst Spill, Building 440	HRR <sup>1</sup>	-	11/14/01	
NA	1A	400-808	Vacuum Pump Leak - Building 442	HRR <sup>1</sup>	-	11/14/01	
NA	1A	400-809	Oil Leak - 446 Guard Post	HRR <sup>1</sup>	-	11/14/01	
NA	1A	500-903	RCRA Storage Unit #1	HRR <sup>1</sup>	-	11/14/01	
NA	1A	700-1107	Compressor Waste Oil Spill - Building 776	HRR <sup>1</sup>	-	11/14/01	
NA	1A	700-1109	Uranium Incident - Building 778	HRR <sup>1</sup>	-	11/14/01	
NA	1A	800-1202	Sulfuric Acid Spill, Building 883	HRR <sup>1</sup>	-	11/14/01	

*List of Recently Approved NFAs*  
*Table 1*

IHSS	OU	PAC	DESCRIPTION	IDENTIFIED	UPDATED	APPROVED	NOTES
NA	IA	800-1203	Sanitary Sewer Line Break Between Buildings 865 and 886	HRR <sup>1</sup>	-	11/14/01	
NA	IA	800-1206	Fire, Building 883	HRR <sup>1</sup>	-	11/14/01	
NA	IA	800-1211	Capacitor Leak, Building 883	HRR <sup>1</sup>	-	11/14/01	
NA	IA	900-1302	Gasoline Spill	HRR <sup>1</sup>	-	11/14/01	
NA	IA	900-1303	Natural Gas Leak	HRR <sup>1</sup>	-	11/14/01	
NA	IA	900-1304	Chromic Acid Spill - Building 991	HRR <sup>1</sup>	-	11/14/01	
NA	IA	900-1305	Building 991 Roof	HRR <sup>1</sup>	-	11/14/01	

TABLE 2 Clarifications to documentation associated with recently approved NFA/NFRA sites

YEAR	PAC	TITLE	CORRECTION / CLARIFICATION
2000	600-164 1	B771 Radioactive Slab	Appendix 1, pg 124 The correct title should read <i>Radioactive Slab from Building 771</i>
2000	600-1001(a)	Waste Oil in PAC 1001	Page 47 As stated, PAC 600-1001 <i>will be</i> investigated It is only the waste oil spill identified as 600-1001(a) which was cleaned up upon discovery that is agreed to as NFA
2000	100-607	B111 Transformer PCB Leak	As way of clarification to a statement in the October 2, 2001 CDPHE letter stating that the Site had not proposed this PAC as a potential NFA, This PAC was not proposed in the 2001 Annual Update to the HRR because PAC 600-607 was approved NFA via separate letter dated April 12, 2001, and required no further evaluation.
2001	100-603	B123 Bioassay Waste Spill	Clarification is required due to confusion over the write-up provided under <u>Description of Operation or Occurrence and Physical/Chemical Description Constituent Released</u> in the 2001 HRR The release was contained with-in the trench and 8 feet of the building with berms as confirmed by sampling. Based on this, rainwater being pumped from the trench at the time of the release at locations greater than 8 feet from the building and both south and southeast of the building was not contaminated by the release The contaminated rainwater contained with-in the bermed area of the trench totaled approximately 100 gallons and was neutralized, pumped and treated at 374



Colorado Department  
of Public Health  
and Environment



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April 2, 2002

Mr Joe Legare  
Assistant Administrator for Environment and Infrastructure  
U S Department of Energy-RFFO  
10808 Highway 93, Unit A  
Golden CO 80401-8200

RE No Further Action Justification for Building 125 Under Building Contamination

Dear Mr Legare

The Colorado Department of Public Health and Environment and the Environmental Protection Agency have reviewed the document referenced above. The agencies concur with the justification in this Interim Update to the Historical Release Report. We therefore approve this recommendation for No Further Action for UBC-125.

If you have any questions concerning the approval of this document, please contact Carl Spreng of CDPHE at 303-692-3358 or Gary Kleeman of EPA at 303-312-6246.

Sincerely,

Steven H Gunderson  
RFCA Project Coordinator  
Colorado Department of Public  
Health and Environment

Tim Rehder  
Rocky Flats Project Manager  
Environmental Protection Agency

cc Reg Tyler, DOE  
Dave Shelton, K-H  
Lane Butler, K-H  
Administrative Record, T130G

Dan Miller, AGO  
Susan Chaki, CDPHE  
Steve Tarlton, CDPHE-RFOU



Colorado Department  
of Public Health  
and Environment



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September 26, 2002

Mr Joe Legare  
Assistant Administrator for Environment and Infrastructure  
U S Department of Energy-RFFO  
10808 Highway 93, Unit A  
Golden CO 80401-8200

RE Approval of NFA designation for IHSSs, PACs, and PICs

Dear Mr Legare

Since 1994 the Site has been proposing IHSSs and PACs for No Further Action (NFA) or No Further Remedial Action (NFRA) in the annual and quarterly Updates to the Historic Release Report (HRR) In the fall of 2001 an NFA Working Group developed and implemented a systematic approach for reviewing NFA/NFRA proposals in accordance with RFCA Attachment 6 and the Implementation Guidance Document Using this systematic approach, 28 additional sites were approved as NFA/NFRA sites at Working Group meetings during January through April 2002 In addition, 48 of the 61 Potential Incidents of Concern (PICs) described in the original 1992 HRR were approved as NFAs The remaining 13 PICs will be discussed further during future Working Group meetings This letter provides formal approval of the 28 NFA/NFRA sites and the 48 PICs listed in the attached table Approved meeting minutes are located in the Site Project File and provide a record of discussions and agreements reached among NFA Working Group members

If you have any questions please contact Gary Kleeman (EPA), 303-312-6246, Carl Spreng (CDPHE), 303-692-3358 or Reginald Tyler (DOE), 303-966-5927

Sincerely,

Steven H Gunderson  
RFCA Project Coordinator  
Colorado Department of Public  
Health and Environment

Tim Rehder  
Rocky Flats Project Manager  
Environmental Protection Agency

# STATUS OF PROPOSED NFAs

IHSS	OU	PAC	DESCRIPTION	IDENTIFIED	UPDATED	NOTES	MEETING DATE
206	IA	300-206	Inactive D-836 Hazardous Waste Tank	HRR <sup>1</sup>	Annual 2001	NFA	2/27/02
189	IA	600-189	Nitric Acid Tank	HRR <sup>1</sup>	Annual 1997 <sup>3</sup> Annual 2000 <sup>26</sup> Annual 2001	NFA	1/31/02
170	BZ	NW-170	PU&D Storage Yard - Waste Spills	HRR <sup>1</sup>	Annual 1997 <sup>3</sup> Annual 1998 <sup>7</sup> Annual 1999 <sup>7</sup>	NFA	2/27/02
142 6	BZ	NE-1404	Diesel Spill at Pond B-2 Spillway	Quarterly 2 <sup>5</sup>	Quarterly 3 <sup>6</sup> Annual 1998 <sup>7</sup>	NFA	2/27/02
212	IA	300-212	Building 371 Drum Storage Area, Unit 63 (deferred to Part VIII of the RFETS RCRA Mixed Residues Modification, see Annual 1997)	HRR <sup>1</sup>	Annual 1997 <sup>3</sup>	NFA	2/27/02
NA	IA	700-1114a	Release During Liquid Transfer Operations from Bldg 774	Annual 1997 <sup>3</sup>	-	NFA	2/27/02
NA	IA	700-1114b	Release During Liquid Transfer Operations from Bldg 774	Annual 1997 <sup>3</sup>	-	NFA	2/27/02
109	BZ	900-109	Trench T-2 - Ryan's Pit	HRR <sup>1</sup>	Annual 1996 <sup>2</sup> Annual 1997 <sup>3</sup>	NFA	4/03/02



# STATUS OF PROPOSED NFAs

IHSS	OU	PAC	DESCRIPTION	IDENTIFIED	UPDATED	NOTES	MEETING DATE
NA	IA	400-814	Air Conditioner Compressor Release, Bldg 444 Roof	Quarterly 8 <sup>15</sup>		NFA	3/13/02
NA	BZ	NE-1410	Diesel Fuel Spill at Field Treatability Unit	Quarterly 7 <sup>9</sup>	-	NFA	1/31/02
NA	BZ	NE-1411	Diesel Fuel Overflowed from Tanker at OU 2 Field Treatability Unit	Quarterly 7 <sup>9</sup>	-	NFA	2/27/02
114	7	NW-1504	Improper Disposal of Thorosilane Contaminated Material at Landfill	Quarterly 7 <sup>9</sup>	-	NFA	1/31/02
NA	IA	000-503	Solar Pond Water Spill Along Central Avenue	Quarterly 7 <sup>9</sup>	-	NFA	1/31/02
NA	IA	100-613	Asphalt Surface in Lay Down Yard North of Building 130 (identified as 000-501 in Quarterly 4 <sup>8</sup> , reassigned as 100-613 in Quarterly 7 <sup>9</sup> )	Quarterly 4 <sup>8</sup>	Quarterly 7 <sup>9</sup>	NFA	2/27/02
NA	IA	300-711	Ni-Cad Battery Spill Outside of Building 373	Quarterly 1 <sup>24</sup>	Quarterly 7 <sup>9</sup>	NFA	1/31/02
NA	IA	300-712	1/2 gal Antifreeze Spilled by Street Sweeper Outside of Building 373	Quarterly 7 <sup>9</sup>	-	NFA	1/31/02
NA	BZ	SE-1600	Pond 7 - Steam Condensate Releases	HRR <sup>1</sup>	-	NFA	4/03/02

Miscellaneous Sites EPA approved in 1992 (COPPER) and verbally concurred. Need written concurrence.



**Kleeman.Gary@epamail.epa.gov**

07/30/02 05 41 PM

To Reginald Tyler@rf doe gov  
cc Marcella Brioussard@rfets gov, carl spreng@state co us  
Subject PICs

Here are the PICs that I feel warrant further investigation #s 6, 9, 11, 14, 18, 41, 42, and 44 gk

## **Appendix 3**

### **Areas of (Non RFCA) Soil Put-back**

# **Appendix 4**

## **Plates**

THIS TARGET SHEET REPRESENTS AN  
OVER-SIZED MAP / PLATE FOR THIS DOCUMENT:  
(Ref: 01-RF-02273; JLB-021-01)

# **Annual Update Historical Release Report**

(August 1, 2001 through August 1, 2002)

**September 2002**

**Plate 1:**

## **Individual Hazardous Substance Sites by Consolidated Operable Unit**

*As of September 2002*

**September 27, 2002**

**CERCLA Administrative Record Document, SW-A-004400**

U S DEPARTEMENT OF ENERGY  
ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE

GOLDEN, COLORADO

THIS TARGET SHEET REPRESENTS AN  
OVER-SIZED MAP / PLATE FOR THIS DOCUMENT:  
(Ref. 01-RF-02273; JLB-021-01)

## **Annual Update Historical Release Report**

(August 1, 2001 through August 1, 2002)

**September 2002**

**Plate 2:**

### **No Further Action Individual Hazardous Substance Sites and Potential Areas of Concern**

(Including Proposed NFAs)

**As of September 2002**

**September 27, 2002**

**CERCLA Administrative Record Document, SW-A-004400**

U S DEPARTEMENT OF ENERGY  
ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE

GOLDEN, COLORADO

THIS TARGET SHEET REPRESENTS AN  
OVER-SIZED MAP / PLATE FOR THIS DOCUMENT:  
(Ref: 01-RF-02273; JLB-021-01)

# **Annual Update Historical Release Report**

(August 1, 2001 through August 1, 2002)

**September 2002**

**Plate 3:**

## **Original Process Waste Lines and New Process Waste Lines**

**September 27, 2002**

**CERCLA Administrative Record Document, SW-A-004400**

U S DEPARTEMENT OF ENERGY  
ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE

GOLDEN, COLORADO

THIS TARGET SHEET REPRESENTS AN  
OVER-SIZED MAP / PLATE FOR THIS DOCUMENT.  
(Ref 01-RF-02273; JLB-021-01)

## **Annual Update Historical Release Report**

(August 1, 2001 through August 1, 2002)

**September 2002**

**Plate 4:**

### **Potential Areas of Concern and under Building Contamination Sites**

**As of September 2002**

**September 30, 2002**

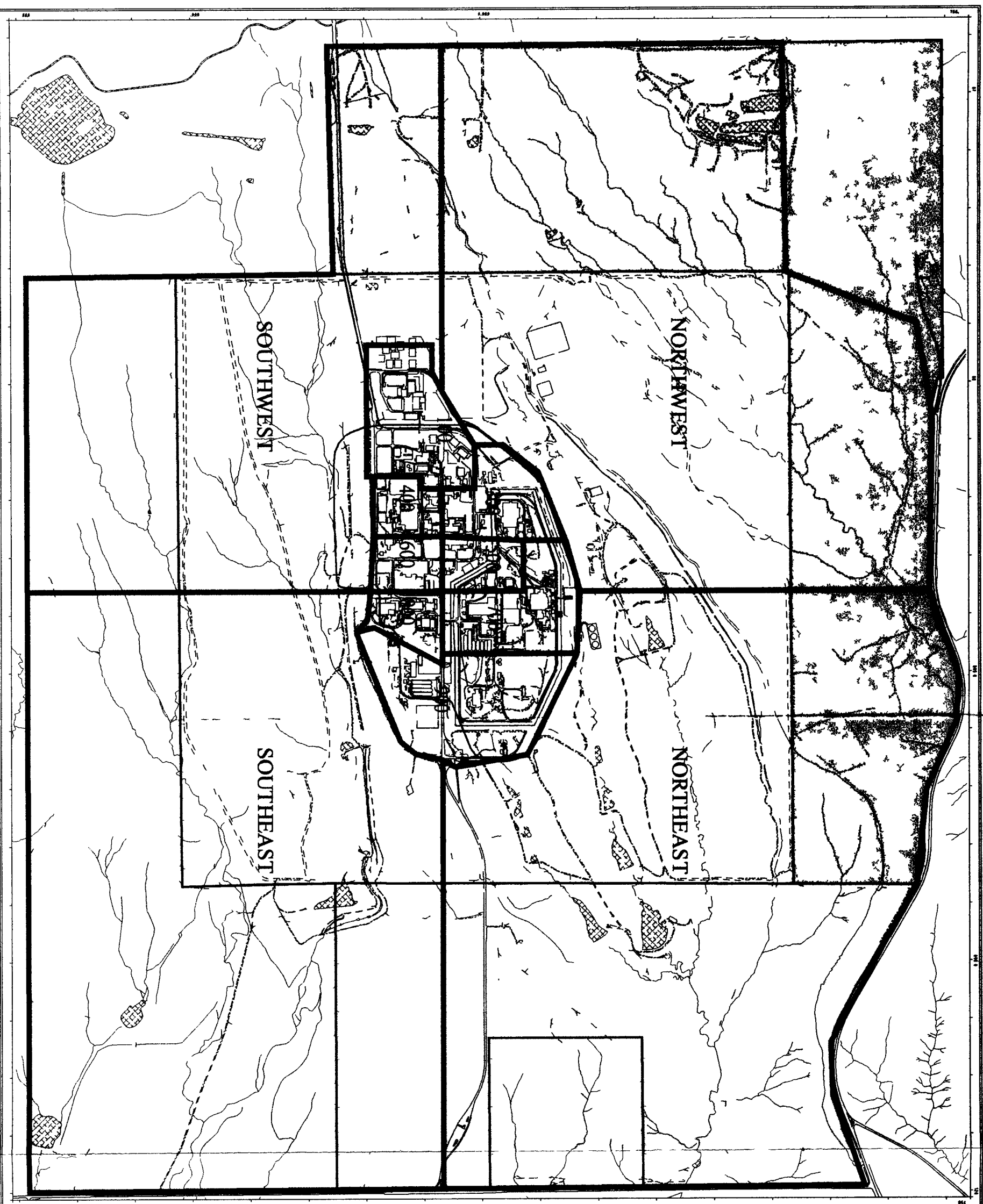
**CERCLA Administrative Record Document, SW-A-004400**

U S DEPARTEMENT OF ENERGY  
ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE

GOLDEN, COLORADO



**Figure 1 1**  
**Historical Release Report**  
**PAC Area Boundaries**



**EXPLANATION**

- N** PAC Area D egregation Boundary
- N** Ind etrial Area Boundary
- N** Property Pur hase Bo da y
- ☐ 1951 Purchase (2 558 Acre )
- ☐ 1974 Purchase
- ☐ 1975 Purchase (2 558 Acre )
- ☐ 1976 Purchase (3 836 Acre )
- ☐ 1978 Purchase

**Standard Map Features**

- ☐ Build g d the structur
- ☐ Lake d po de
- ☐ Streams, ditches, or other draining to tur
- ☐ Paved road
- ☐ D r road

**NOTES:**  
 1. All areas shown on this map are subject to change without notice. The user is responsible for obtaining the most current data. The data is not intended for use in any legal proceeding. The data is provided for informational purposes only.

**Scale:** 1 inch = 1 mile  
 1:62,500  
 1:62,500  
 1:62,500



**Scale:** 1 inch = 1 mile  
 1:62,500  
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**Scale:** 1 inch = 1 mile  
 1:62,500  
 1:62,500  
 1:62,500

**U S D pa m t f E G V**  
**Ra ky F l E wro m nt l l T e h of G V S t**

**Revised by:** **Prepared for:**  
**18 Dept. 800-808-770**

**DynCorp**



**Kaiser Hill**

**Figure 2 1**  
**PAC NE-1407**  
**Sampling Locations**

**KEY**

- Biased Sampling Location
- PAC location
- ▨ Building/structure
- ▨ Paved area
- ▨ Dirt road
- ▨ Stream ditch or other drainage feature

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20 0 20 40 60 80 100 Feet

Scale = 1:800

State Plane Coordinate Projection  
Colorado Central Zone  
Datum: NAD 27

U.S. Department of Energy  
Rocky Flats Environmental Technology Site

Prepared by



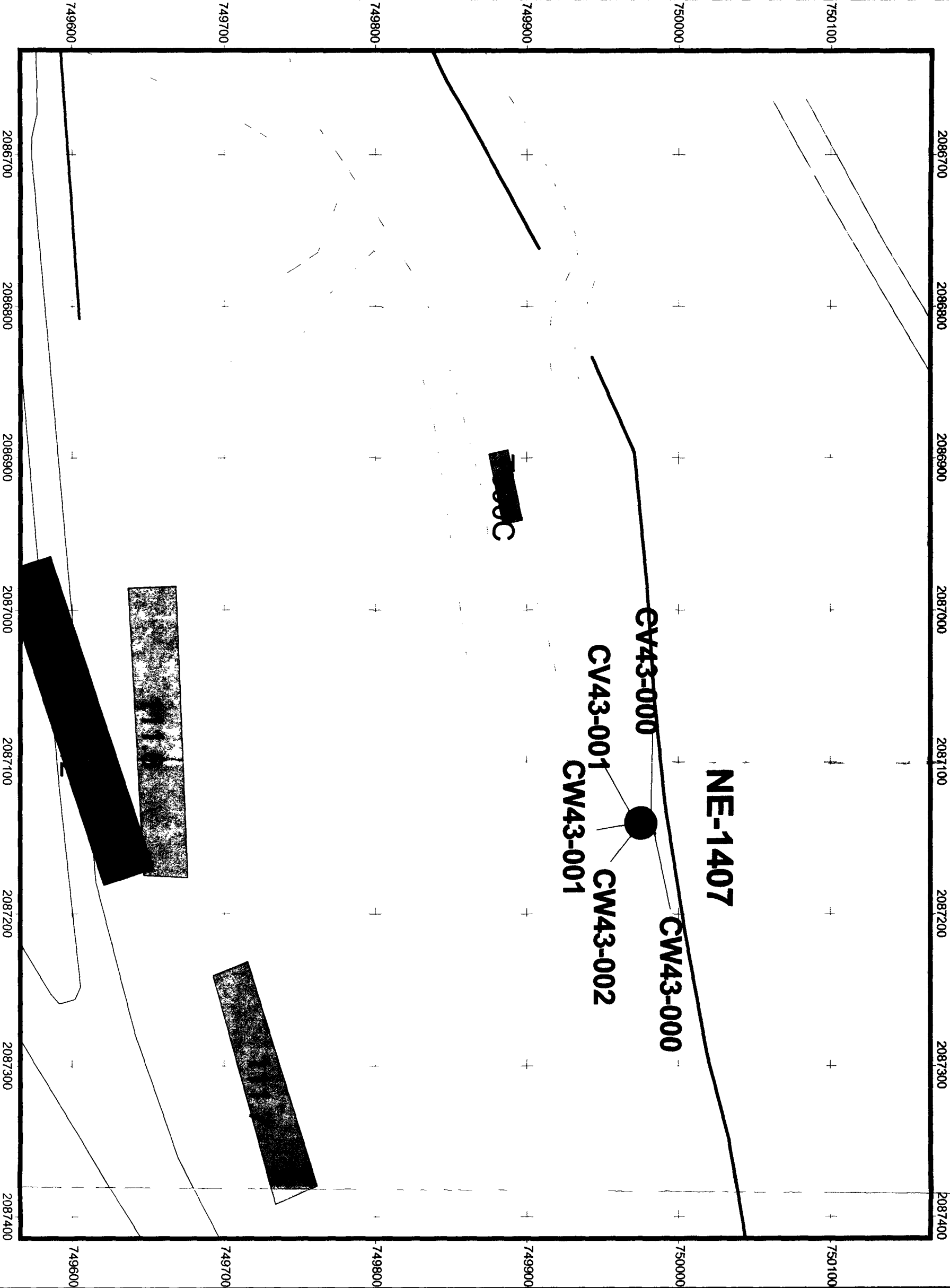
RADMS Workarea

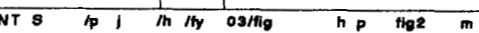


KAISER HILL

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Date: 9/6/02





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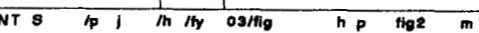
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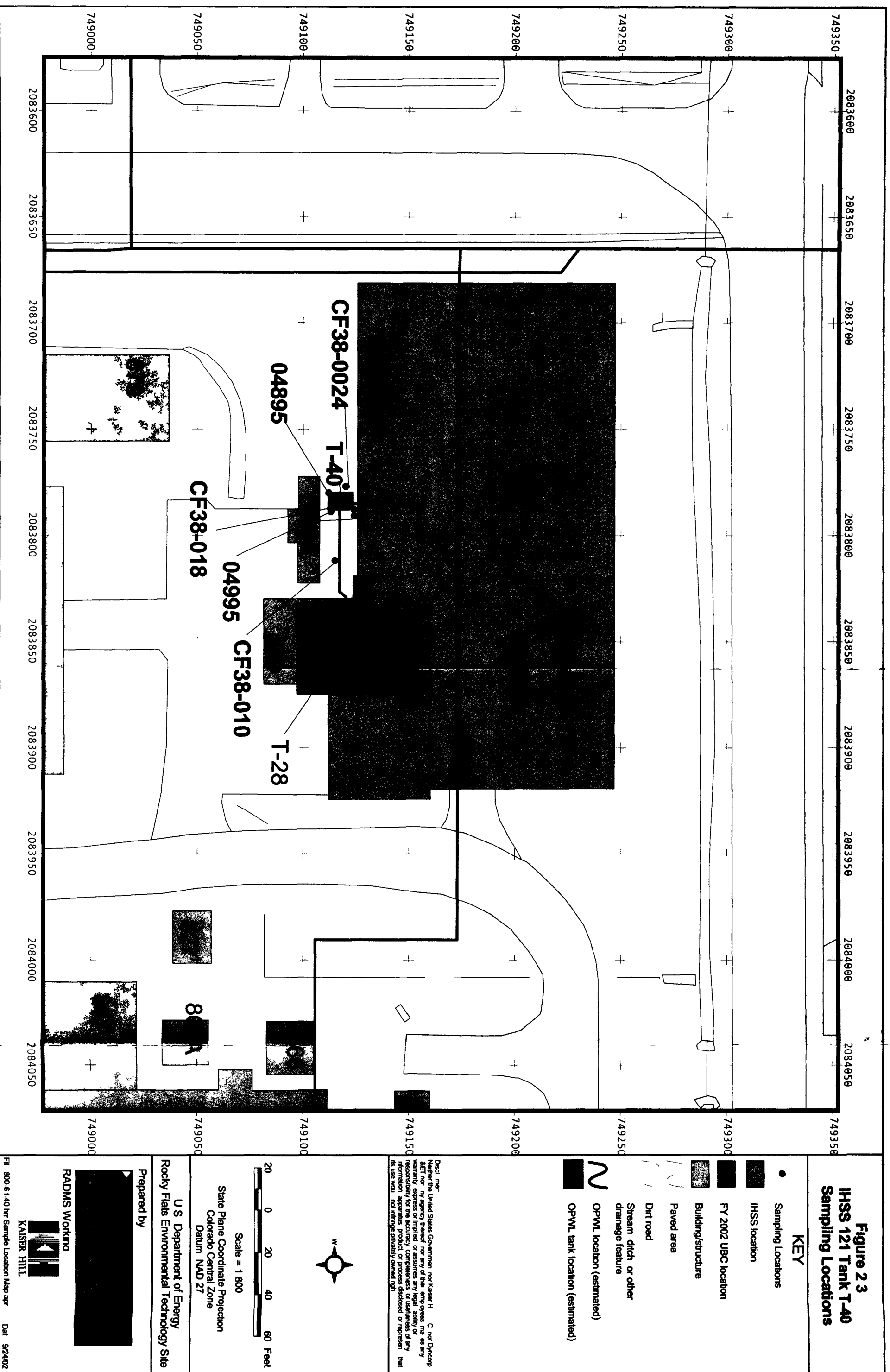
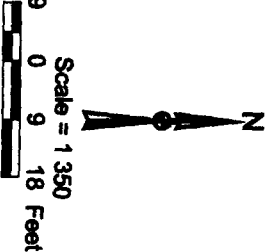




Figure 2.4  
IHSS 100-148  
Sampling Locations

KEY

- IHSS
- UBC
- PAC
- Building
- Stream ditch or other drainage
- Paved area
- Dirt road
- Sampling Location
- Pipeline

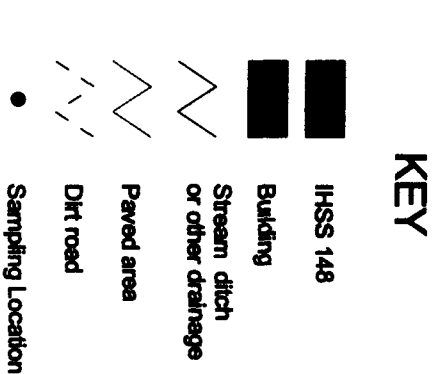


State Plane Coordinate Projection  
Colorado Central Zone  
Datum NAD 27

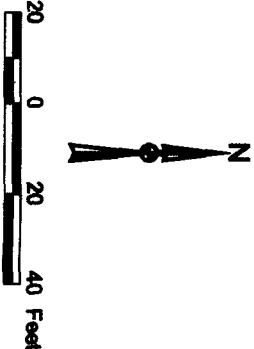
U.S. Department of Energy  
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Figure 2.5  
Confirmation Sampling Results  
Greater Than Background Mean  
Plus Two Standard Deviations or  
Method Detection Limits  
HSSS 148



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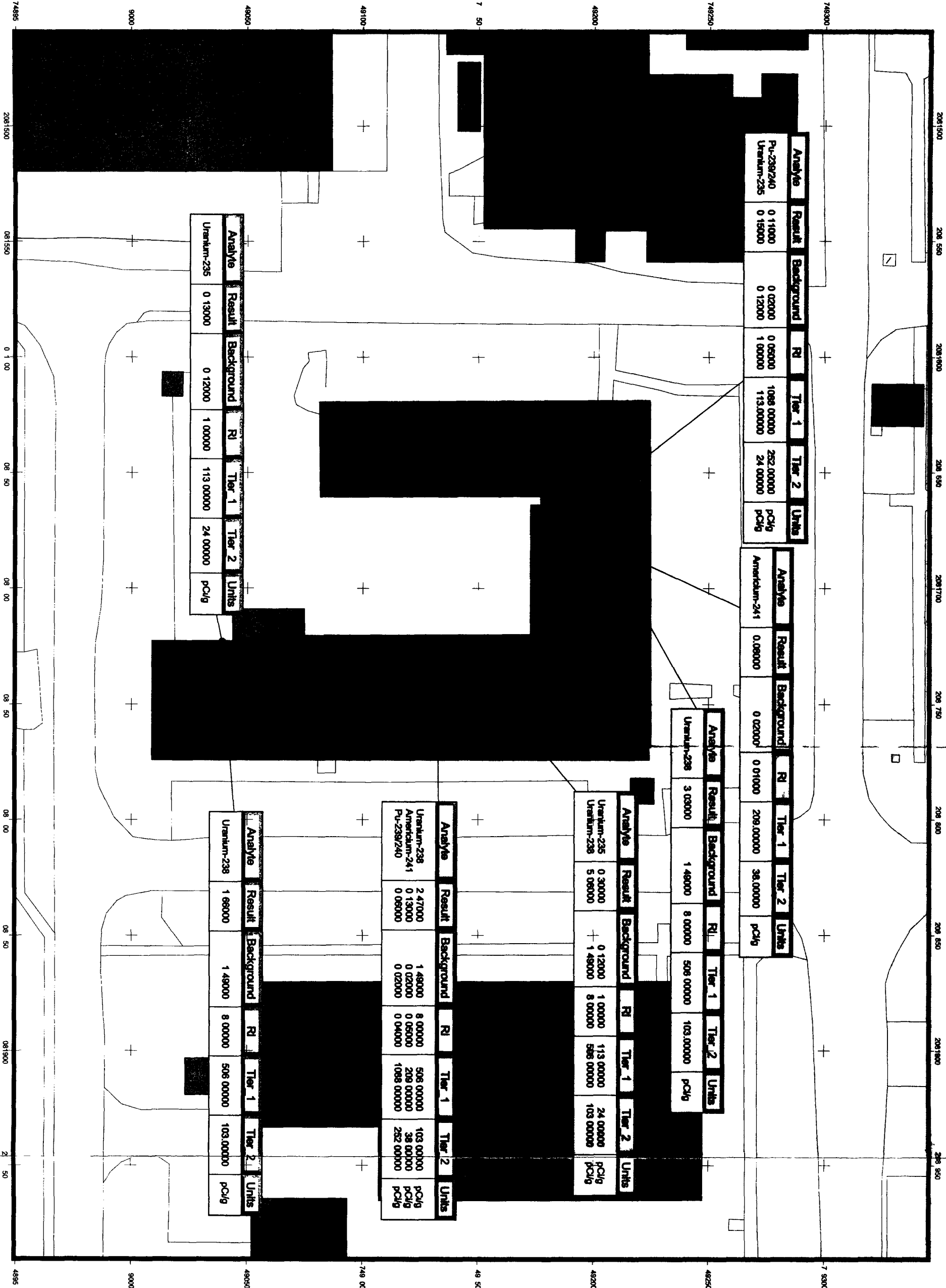
State Plane Coordinate Projection  
Colorado Central Zone  
Datum NAD 27

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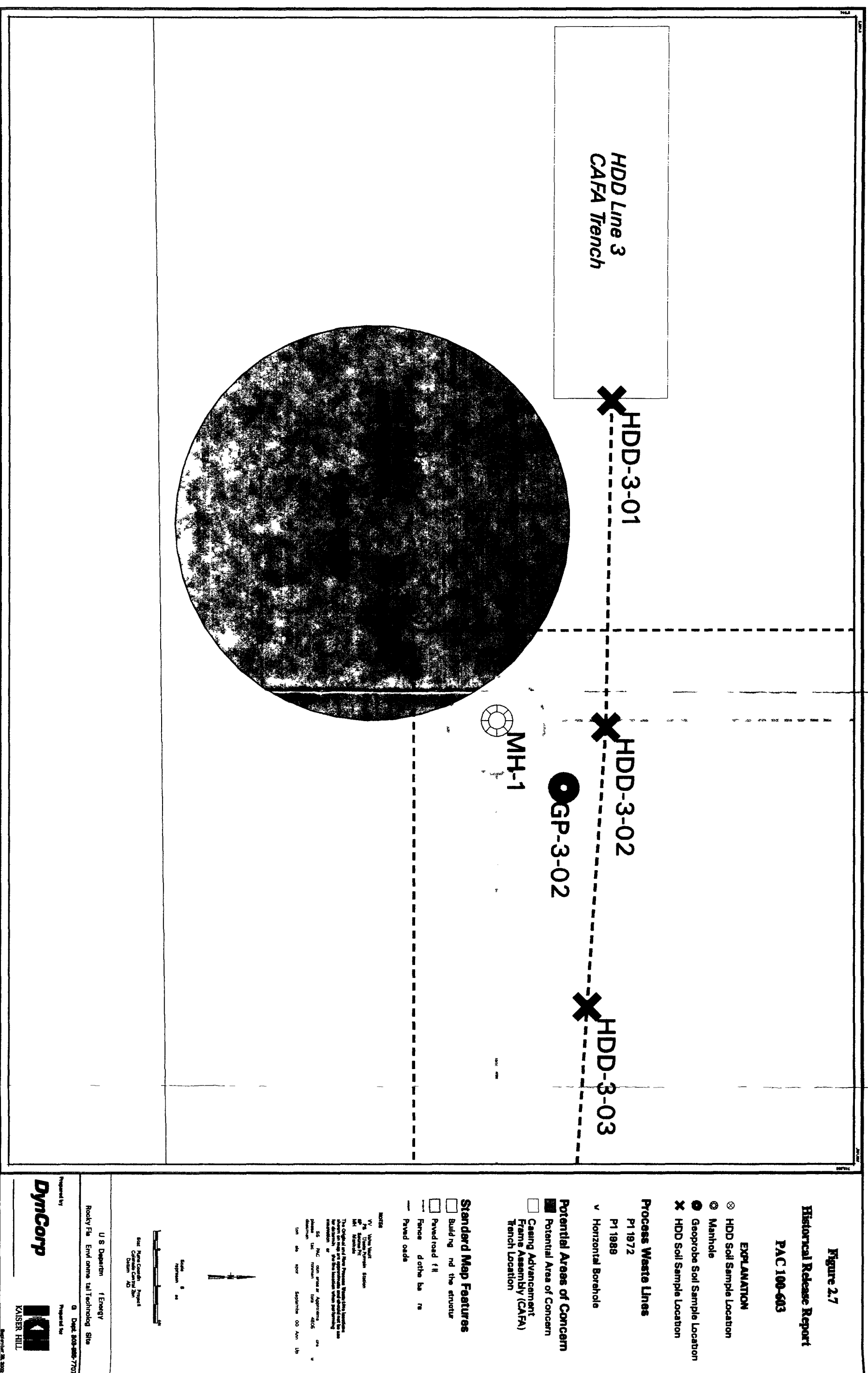


Prepared for:











**Figure 2 8**  
**PAC 100-609**  
**Sampling Locations**

**Key**

- Surface Soil Samples
- Buildings and other structures
- PAC 100-609
- ▤ Paved areas
- ▥ Dirt roads
- ▧ Drainage Features



Scale 1:100



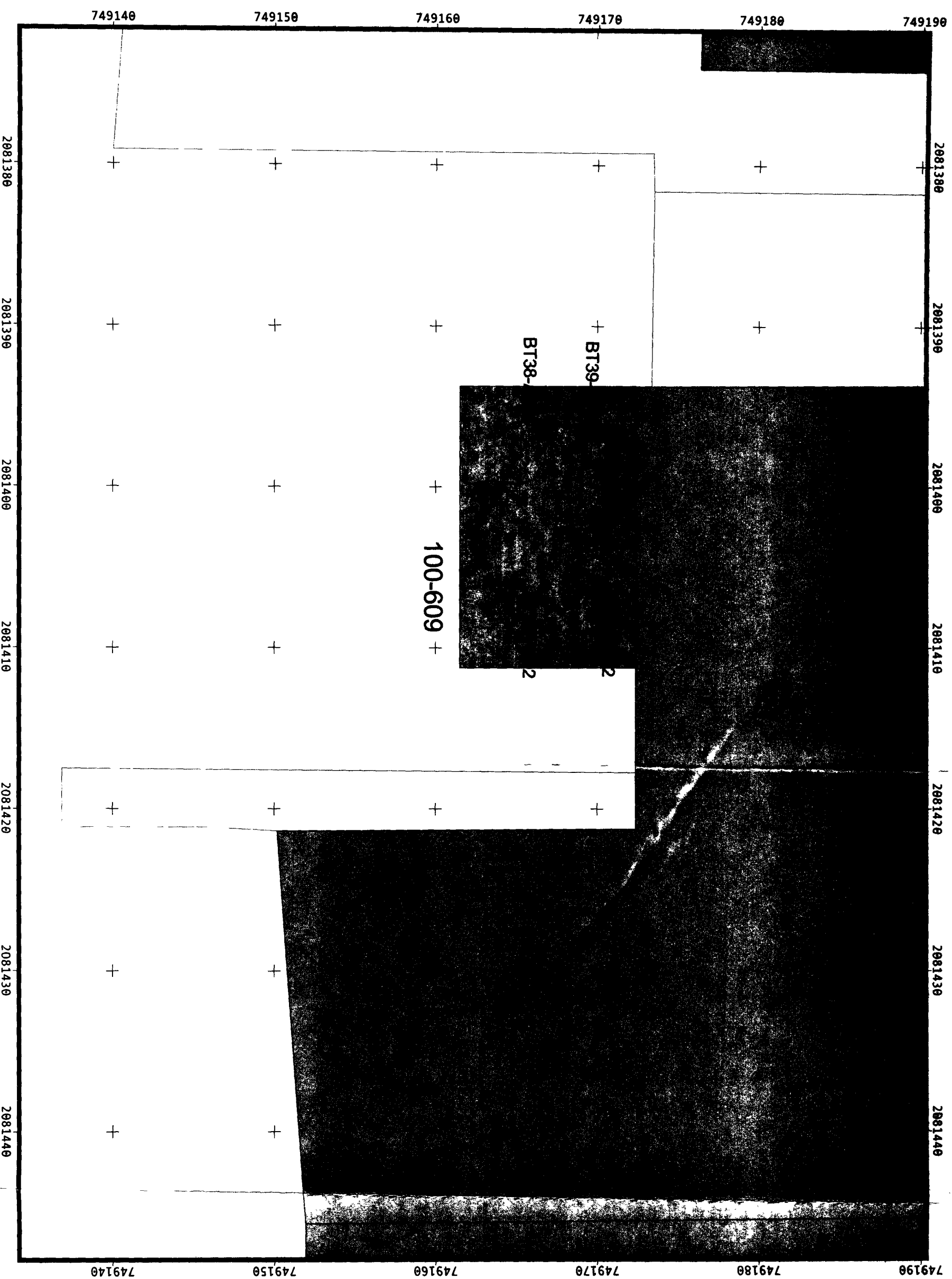
State Plane Coordinate Projection  
Colorado Central Zone  
Datum NAD 27

U S Department of Energy  
Rocky Flats Environmental  
Technology Site

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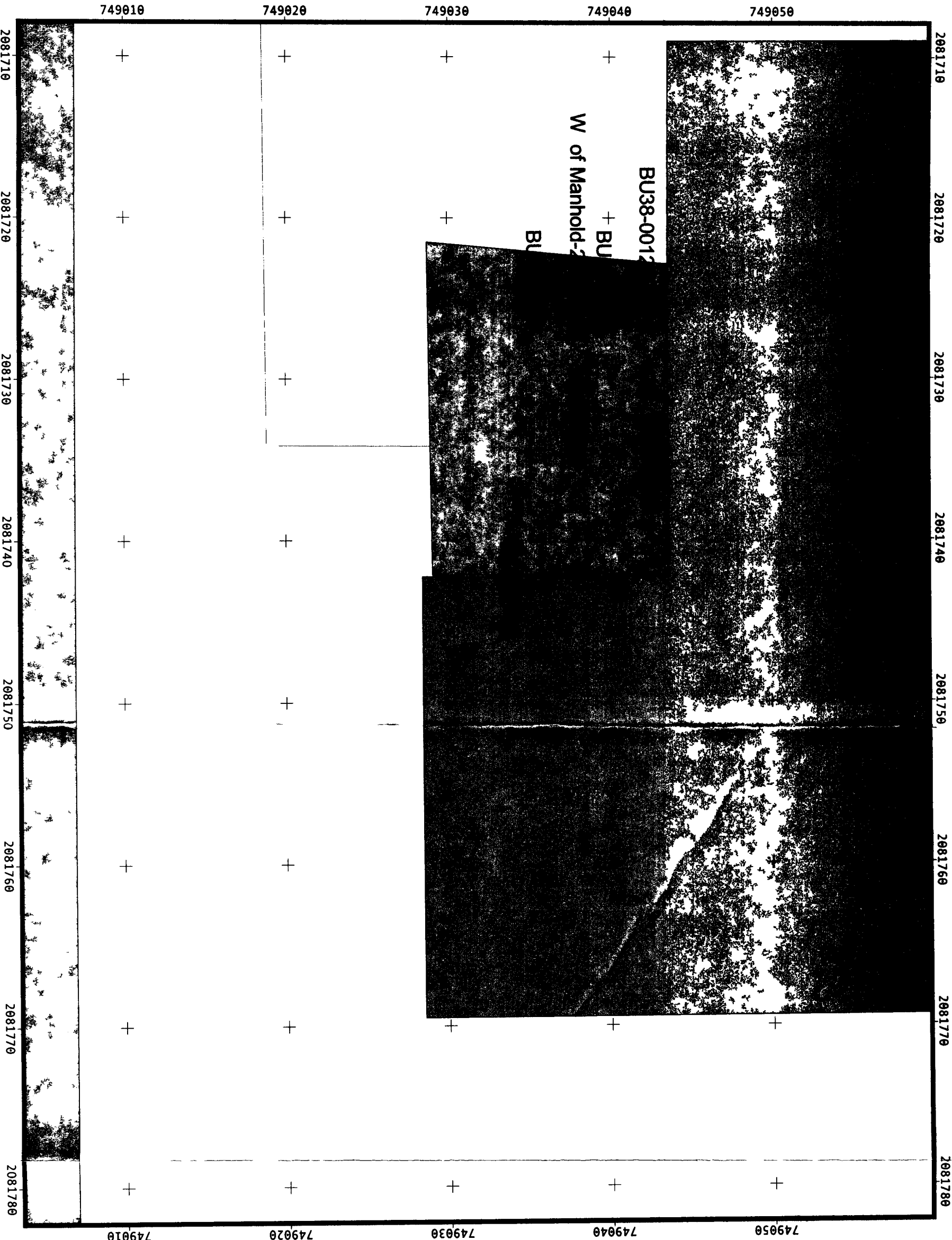


**KAISER HILL**  
COMPANY  
September 2002



165

**Figure 2 9**  
**PAC 100-611**  
**Sampling Locations**



**Key**

- Surface Soil Samples
  - Buildings and other structures
  - PAC 100-611
  - ▽ Paved areas
- pH Reported in Standard Units

N

Scale 1:100

5 0 5 Feet

State Plane Coordinate Projection  
Colorado Central Zone  
Datum NAD 27

U S Department of Energy  
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Technology Site

Prep red By



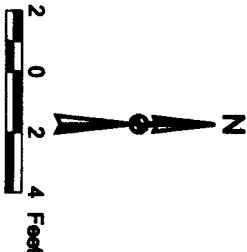
September 2002

Figure 2 10  
PAC 500-906  
Sampling Locations

KEY

- PAC
- Building
- Stream ditch or other drainage
- Paved area
- Dirt road
- Sampling Location

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Scale = 1/75  
State Plane Coordinate Projection  
Colorado Central Zone  
Datum NAD 27

U.S. Department of Energy  
Rocky Flats Environmental Protection Agency

Prepared by:



Prepared by:

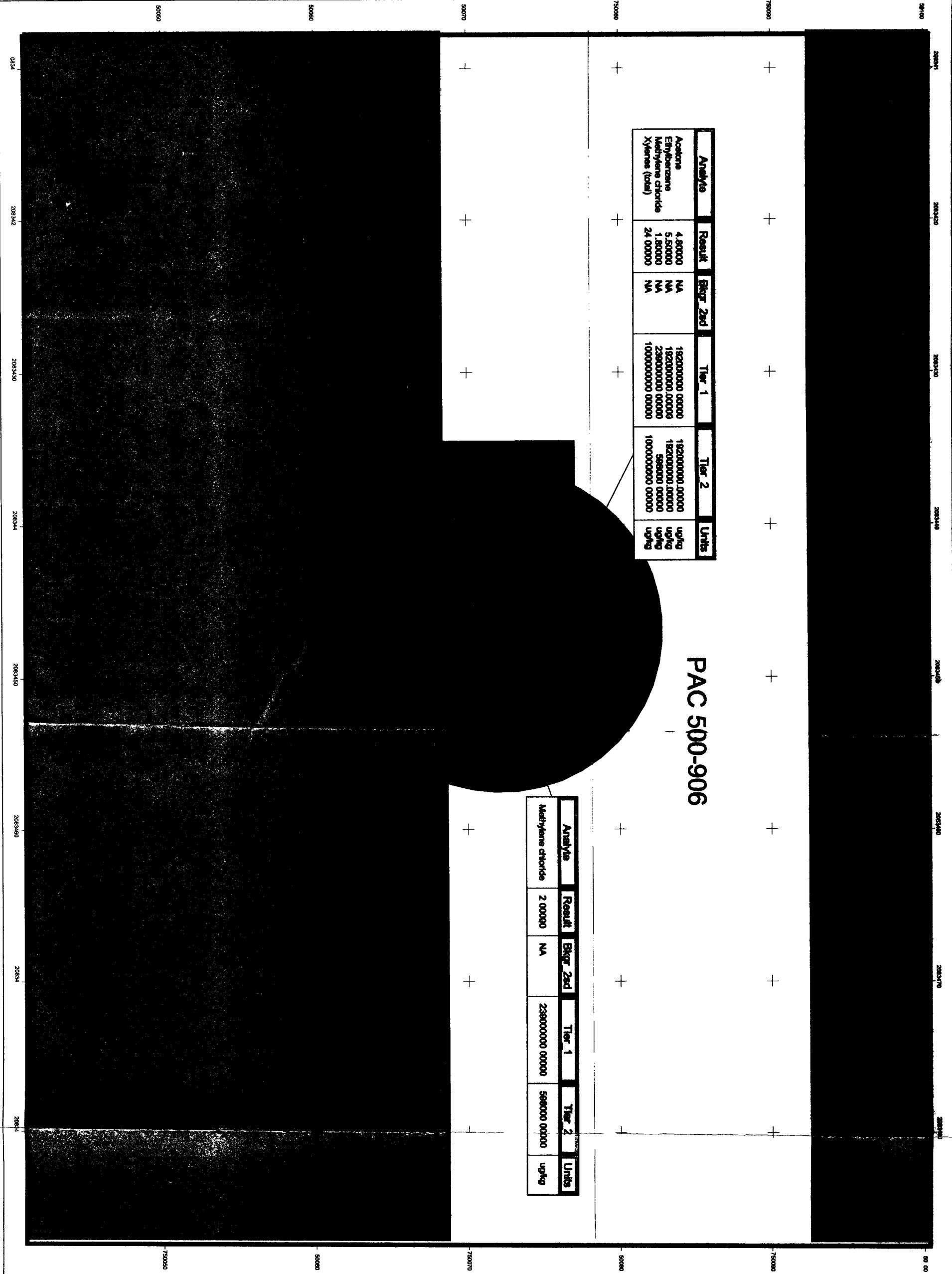


Figure 2 11

Historical Release Report

PAC 600-1005

Sampling Locations

EXPLANATION

● Sample Location

■ Potentially Affected Area (PAC)

Standard Map Features

□ Building or other structures

▨ Disturbed buildings

— Fence and the barriers

== Paved road

- Dirt road

DATA ACQUIRED FROM FEATURES:

Buildings, fences, and other structures are shown as solid black shapes. Disturbed buildings are shown as hatched shapes. Fences and barriers are shown as dashed lines. Paved roads are shown as double lines. Dirt roads are shown as single lines.

NOTES:

All ground features shown are shown as solid black shapes. Disturbed buildings are shown as hatched shapes. Fences and barriers are shown as dashed lines. Paved roads are shown as double lines. Dirt roads are shown as single lines.

NOTE: The map shows the location of the Potentially Affected Area (PAC) and the sampling locations. The map also shows the location of the buildings, fences, and barriers. The map is a historical map and does not show the current status of the site.



Scale 1:330  
1 inch equals approximately 28 feet



State Plane Coordinate at Project two  
Colorado Central  
Datum NAD27

U S Department of Energy  
Rocky Flats Environmental Technology Site

Prepared by

DynCorp

Prepared to



September 28, 2002

666

600-1005

CD35-001



CD35 002

864

Figure 2 12  
PAC 700-1106  
Sampling Locations

KEY

- PAC
- Building
- Paved area
- Dirt road
- Stream ditch or other drainage
- Surface Soil
- Sampling Location

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Scale = 1:100

State Plane Coordinate Projection  
Colorado Central Zone  
Datum NAD 27

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Prepared for



700-1206 apr








September 2002

Analyte	Result	Background	Tier 1	Tier 2	Unit
Americium-241	0.00000	0.02000	209	38	pCi/g
Plutonium-239/240	0.00000	0.07000	1088	252	pCi/g
Uranium-234	0.98000	2.30000	1627	307	pCi/g
Uranium-235	0.00000	0.09000	113	24	pCi/g
Uranium-238	0.98000	2.00000	506	103	pCi/g

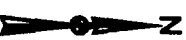
Analyte	Result	Background	Tier 1	Tier 2	Unit
Americium-241	0.00000	0.02000	209	38	pCi/g
Plutonium-239/240	0.00000	0.07000	1088	252	pCi/g
Uranium-234	1.46000	2.30000	1627	307	pCi/g
Uranium-235	0.11000	0.09000	113	24	pCi/g
Uranium-238	1.46000	2.00000	506	103	pCi/g

**Figure 2 13**  
**Historical Release Report**  
**UBC 123**

**KEY**

- |   |                                   |
|---|-----------------------------------|
|  | IHSS                              |
|  | UBC                               |
|  | PAC                               |
|  | Building                          |
|  | Stream ditch or<br>other drainage |
|  | Paved area                        |
|  | Dirt road                         |

## Pipeline



**Scale = 1 350**

10 0 10 20 Feet

State Plane Coordinate Projection  
Colorado Central Zone  
Datum NAD 27

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Rocky Flats Environmental Technology Site**

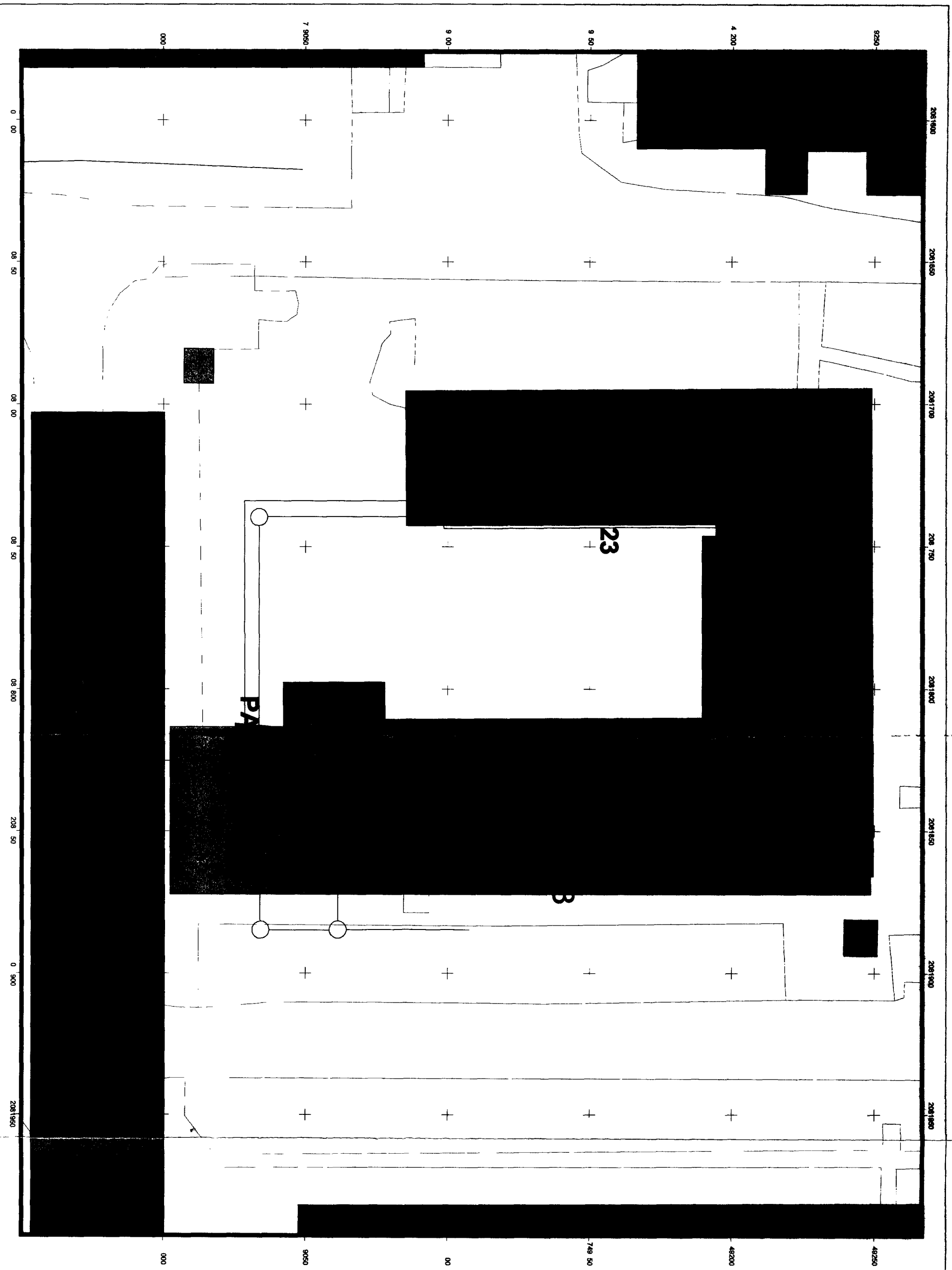
**Prepared by**

Prepared by



res2hut.apr

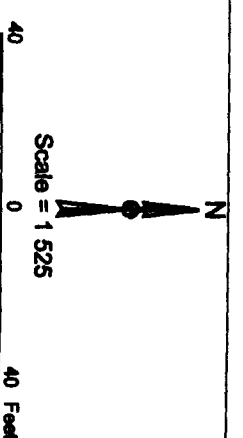
September 2002



**Figure 2 14**  
**Location of Pre-Accelerated**  
**Action Sample Results**  
**Above Detection Limits or**  
**Background Levels for IA Group**  
**100-4 (100-148 100-603**  
**100-611 and UBC 123)**

**KEY**

- FY 2002 IHSS location
- FY 2002 PAC location
- FY 2002 UBC location
- Building/structure
- Paved area
- Dirt road
- Stream ditch or other drainage feature
- Existing soil sampling locations
- Both subsurface and surface soil
- Subsurface soil
- Surface soil



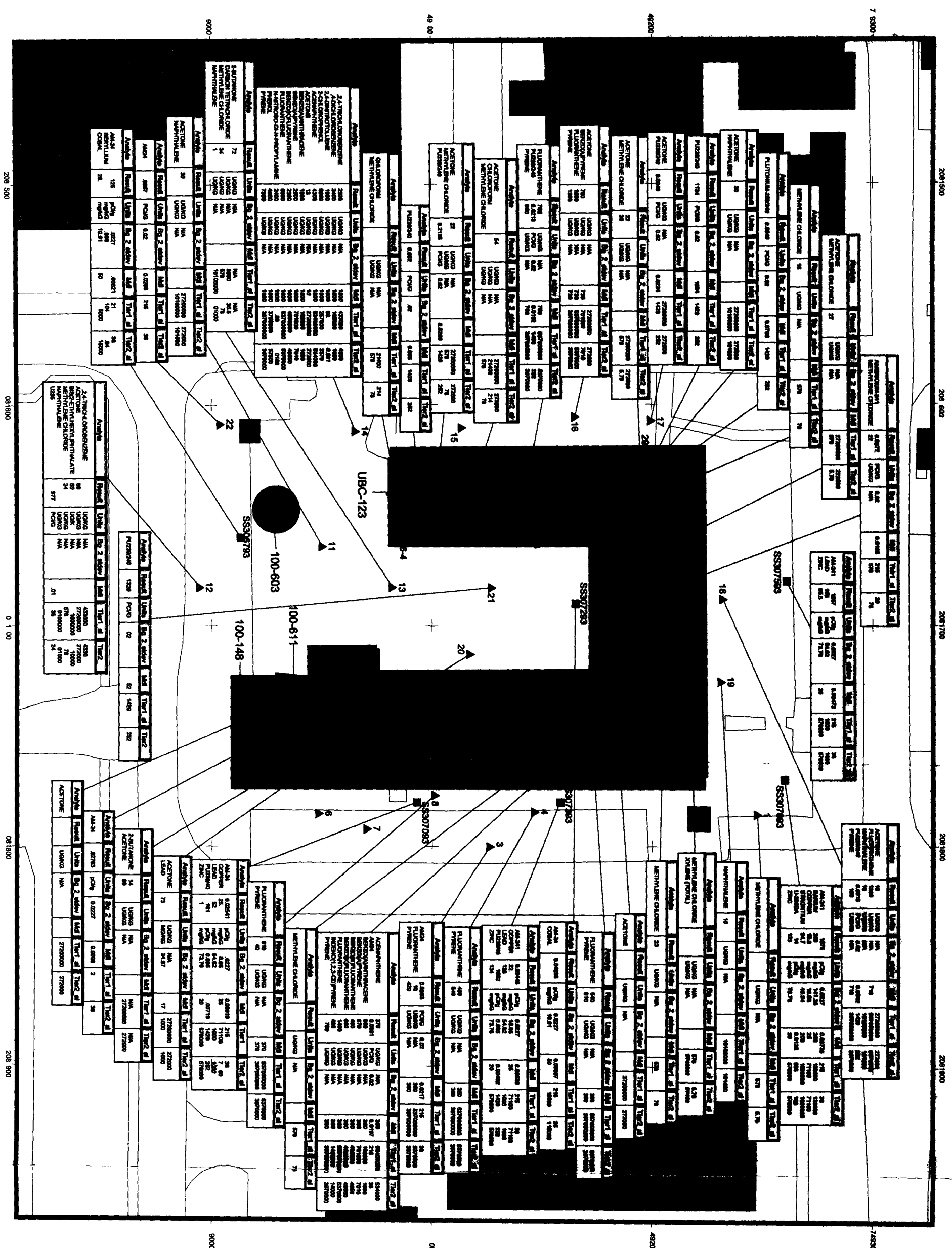
U S Department of Energy  
 Rocky Flats Environmental Technology Site

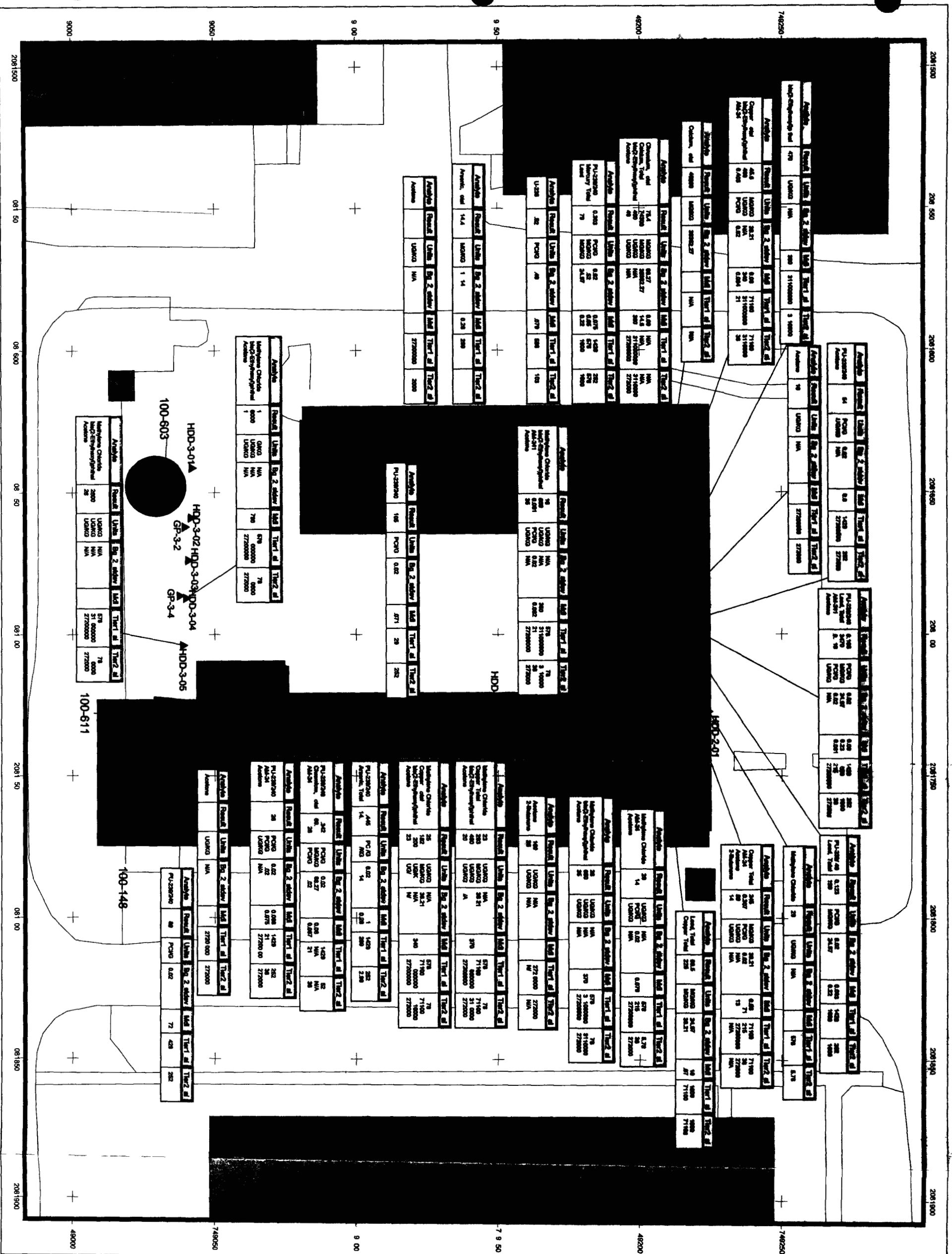
Prepared by  
 Prepared for










KAISER HILL  
 CORP NY

postings02 susan12-03-01thr apr  
 September 2002

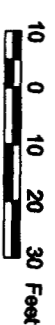




**KEY**

- |   |  |
|---|--|
|    | FY 2002 IHSS location                  |
|    | FY 2002 PAC location                   |
|    | FY 2002 UBC location                   |
|    | Building/structure                     |
|    | Paved area                             |
|    | Drift road                             |
|    | Stream ditch or other drainage feature |
| Existing soil sampling locations  |  |
| <ul style="list-style-type: none"> <li>• Both subsurface and surface soil</li> <li>▲ Subsurface soil</li> <li>■ Surface soil</li> </ul> |  |

Scale = 1 400



State Plane Coordinate Projection  
Colorado Central Zone  
Datum NAD 27

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**Prepared by**





Figure 2 16  
Confirmation Sampling Results  
Greater Than Background Plus  
Two Standard Deviations or  
Method Detection Limits

Key

- Process Waste Lines Left in Place
- Confirmation Samples
- Process Waste Lines Removed
- Pile-as-built
- Buildings and other structures
- IHSS 148
- Paved areas
- Dirt roads
- Drainage Features

N

Scale 1 700

30 0 30 Feet

State Plane Coordinate Projection  
Colorado Central Zone  
Datum NAD 27

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July 2002

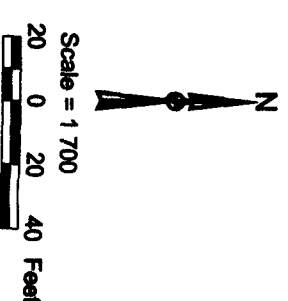


**Figure 2 19**  
Residual Contamination  
at UBC-123

# KEY

- IHSS
- UBC
- PAC
- Building
- Stream ditch or other drainage
- Paved area
- Dirt road
- Pre-accelerated action surface soil sampling location
- Pre-accelerated action subsurface soil sampling location
- Confirmation subsurface soil sampling location
- Stockpile soil sampling location
- Surface soil AOC
- Surface soil Tier II exceedance
- Subsurface soil AOC

Note For organics mg/kg = ug/kg



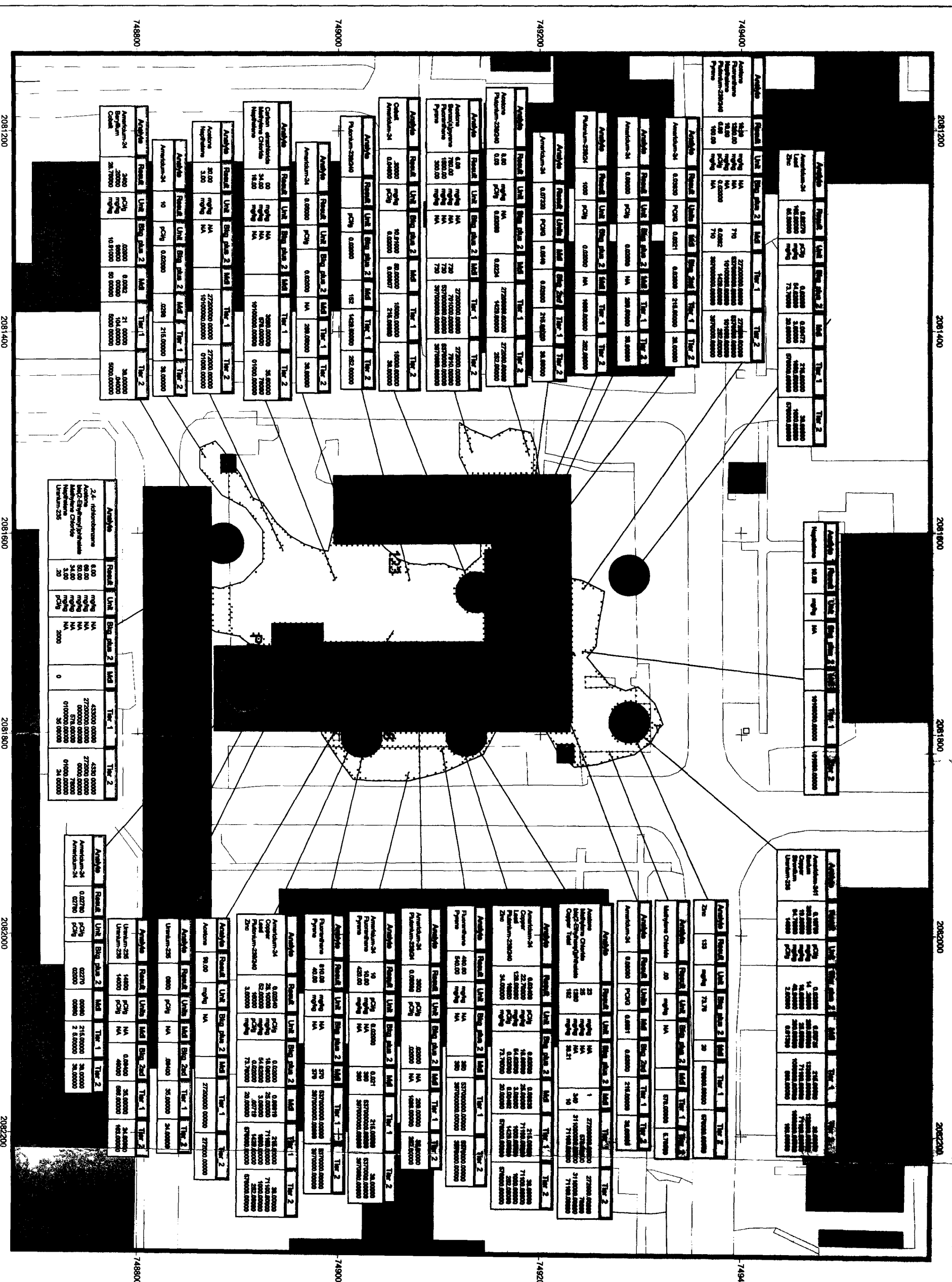
State Plane Coordinate Projection  
Colorado Central Zone  
Datum NAD 27

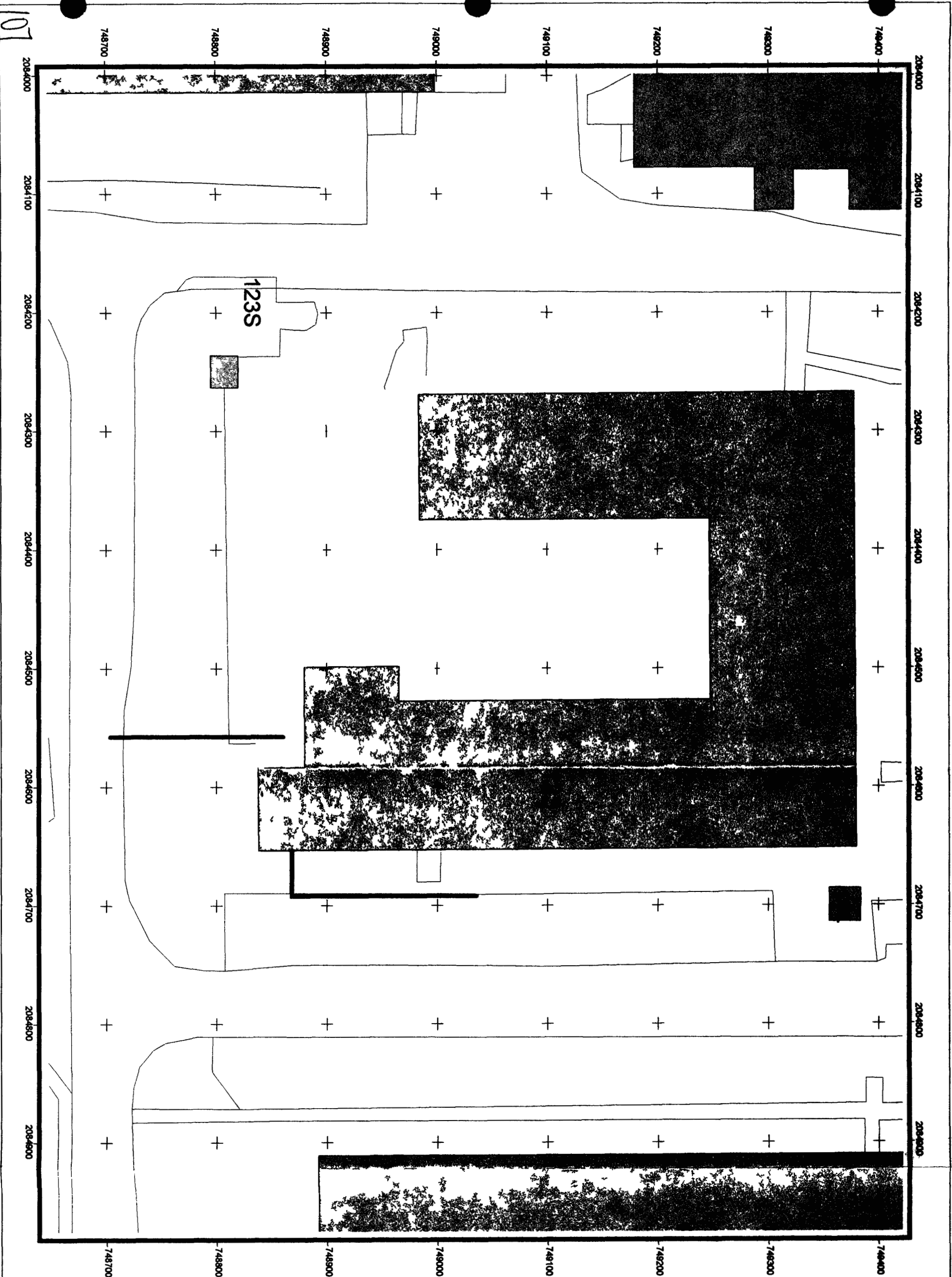
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**KAISER HILL**  
CONF. NY

res2.qpr







June 2002

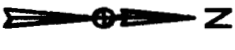




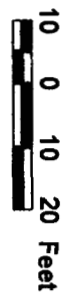
**Figure 2 20**  
**Pipelines Left In Place**

**Key**

-  PWLs Left in Place
-  Buildings and other structures
-  IHSS 148
-  Paved areas
-  Dirt roads
-  Drainage Features



Scale 1 500



State Plane Coordinate Projection  
 Colorado Central Zone  
 Datum NAD 27

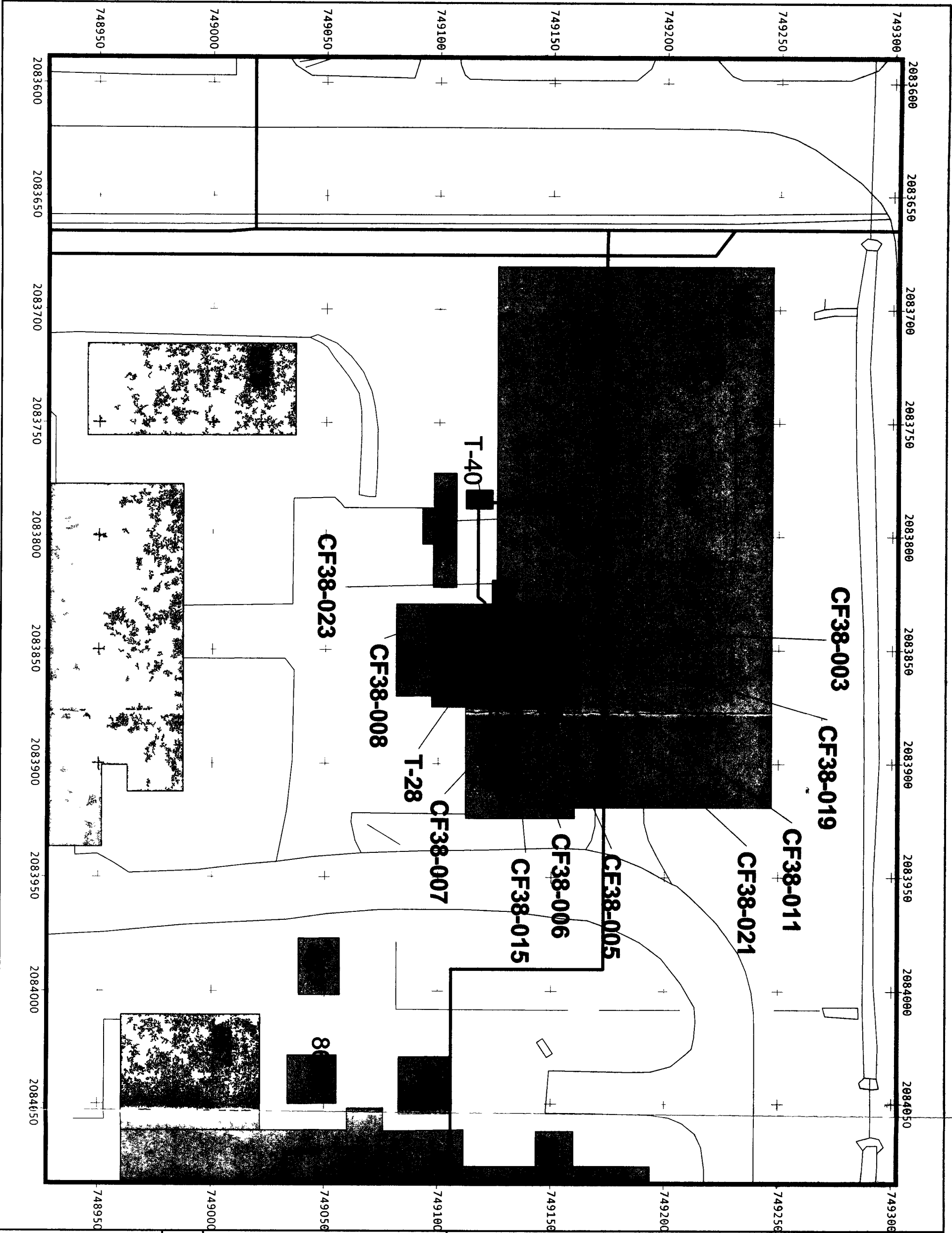
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July 2002

114



**Figure 2.21**  
**UBC 889 and IHSS 121**  
**Tank T 28 Sampling Locations**

**KEY**

- FY 2002 biased sampling location
- FY 2002 IHSS location
- FY 2002 UBC location
- Building/structure
- ▨ Paved area
- ▧ Dirt road
- ▧ Stream ditch or other drainage feature
- ▧ OPWL location (estimated)
- ▧ OPWL location (estimated)
- OPWL tank location (estimated)

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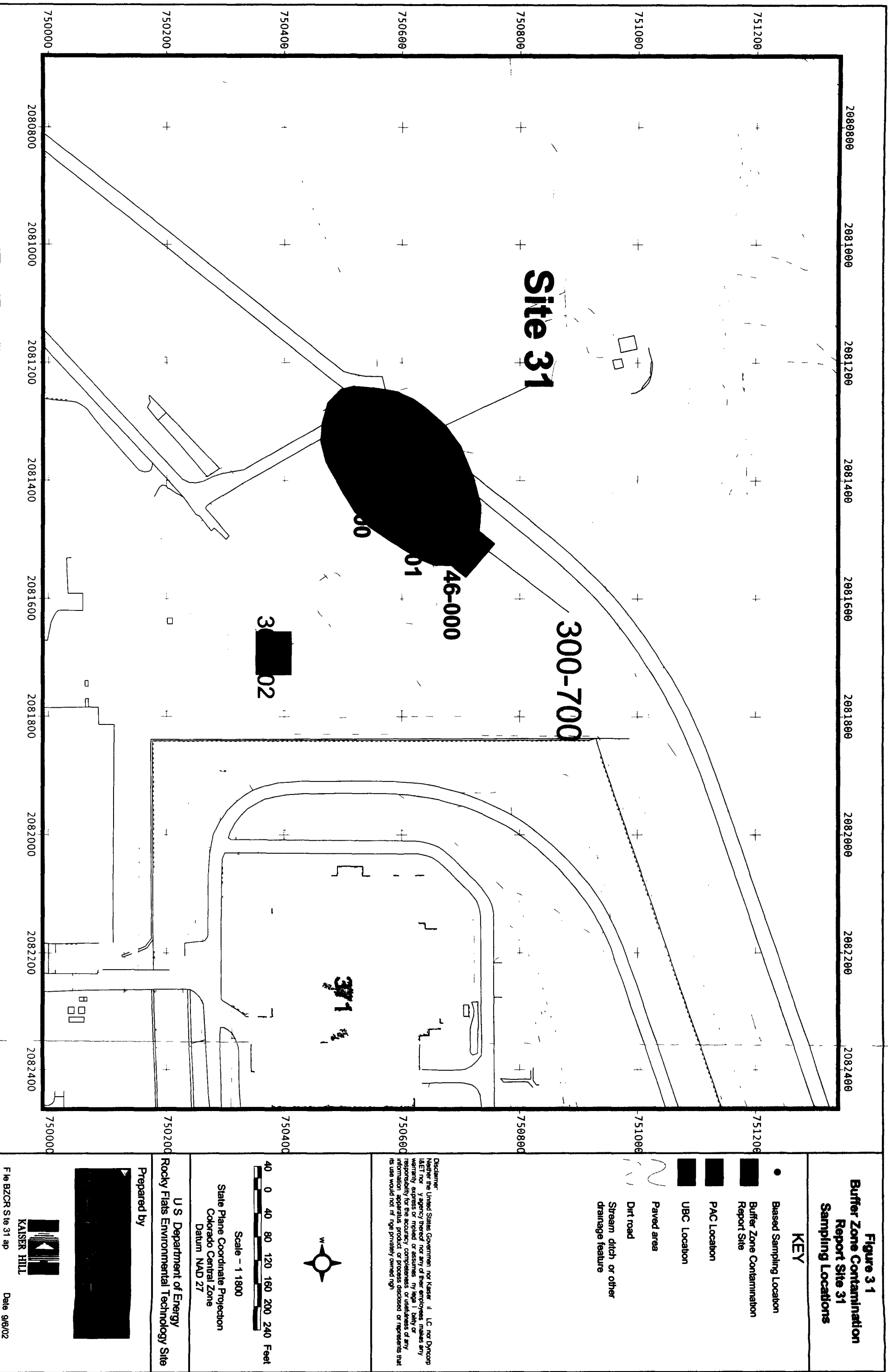
Scale = 1:500  
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State Plane Coordinate Projection  
Colorado Central Zone  
Datum NAD 27

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## Generated Soils Returned to Place of Origin

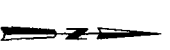
### EXPLANATION

- **Soil Replacement Area**  
**Assigned NFA PAC Designation**

## Standard Map Features

-  Building and other structures
-  Demolished buildings
-  Solar Evaporation Ponds (SEPs)
-  Lakes and ponds
-  Streams, ditches or other drainage features
-  Fences and other barriers
-  Paved roads
-  Dirt roads

**DATA SOURCE BASE FEATURES:**  
bulleting, fences, ideography mode and of  
characters from 954 serial 11-year dat  
captured by EGDS RSL, Las Vegas.  
Digitized from the orthographic. /95



Scale 1 4080  
1 inch represents 1341 feet

Stat Pl n Co d at Pr i ti  
Col ad Co t lZ n  
Dat m NAD27

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Q18 Dept. 243-625-7707

Prepared by

**Prepared for**

**DynCorp**



Kaiser Aluminum

**September 26, 2002**

Page 151

**Plate 3**  
**Historical Release Report**  
**Original Process Waste Lines**  
**and**  
**New Process Waste Lines**

- EXPLANATION**
- Tanks of Concern
  - Foamed and Stabilized Tanks (Source Removed - Interim Status)
  - Remaining Tanks
  - Sumps
  - Process Waste IHSS Locations (Former OU 9 IHSSs)
  - Original Process Waste Lines (IHSS 000-121)
  - Location of Original Process Waste Lines that may have been removed
  - Pipe Currently in Use
  - Pipe Made of Vitrified Clay
  - Cannot Verify if Pipe Exists
  - Leaks Along the Pipe
  - Pipe Failed Pressure Test
  - Known Leaks
  - Manholes
  - Approximate Location of New Process Waste Lines (PAC 000-504)
  - Valve Vault Locations
- NOTES:**

- Standard Map Features**
- Buildings and other structures
  - Demolished buildings
  - Solar Evaporation Ponds (SEPs)
  - Lakes and ponds
  - Streams, ditches, or other drainage features
  - Fences and other barriers
  - Paved roads
  - Underground tunnels

**DATA SOURCE BASE FEATURES:** Site IHSSs, PAC 000-504, DOE 1992, HRR Report and Subsequent Updates.

All IHSS and PAC's Boundaries are Approximate. For more information, see the Environmental Restoration (ER) Report for the following document:  
Historical Release Report (HRR) September 2002 Annual Update

Scale: 1" = 2450'  
1 inch represents approximately 204 feet

State Plane Coordinate Projection  
Colorado Central Zone  
Datum: NAD27

U.S. Department of Energy  
Rocky Flats Environmental Technology Site

Prepared by: **DynCorp**  
THE ART OF TECHNOLOGY

Prepared for: GIS Dept. 303-966-7707

KAISER-HILL  
CORPORATION

September 27, 2002





Plate 2

No Further Action  
Individual Hazardous Substance Sites

and  
Potential Areas of Concern  
(Including Proposed NFAs)  
(As of Sept. 2002)

EXPLANATION

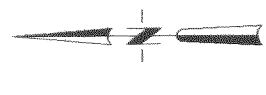
- Operable Unit 1 (Closed through CAD/ROD Process)
- Former Operable Unit 2
- Operable Unit 5
- Operable Unit 6
- Operable Unit 7
- Former Operable Unit 8
- Former Operable Unit 10
- Operable Unit 11 (Closed through CAD/ROD Process)
- Former Operable Unit 12
- Former Operable Unit 13
- Former Operable Unit 14
- Operable Unit 15 (Closed through CAD/ROD Process)
- Operable Unit 16 (Closed through CAD/ROD Process)
- Potential Area of Concern (Proposed as No Further Action)
- No Further Action PACs approved by Colorado Department of Health and EPA in 1992.
- Under Building Contamination Site
- Foamed & Stabilized Tanks (Source Removed - RCRA Interim Status)
- Removed Tanks
- Industrial Area Operable Unit Boundary
- HRR Designation Area Boundary

Standard Map Features

- Buildings and other structures
- Solar Evaporation Ponds (SEPs)
- Lakes and ponds
- Streams, ditches, or other drainage features
- Fences and other barriers
- Paved roads
- Dirt roads

DATA SOURCE BASE FEATURES:  
Locations of the Operable Units and their associated Individual Hazardous Substance Sites (IHSS) were determined from the 1992 - HRR Report and subsequent updates.  
Operable Units 1, 3, 11, 16 are designated to be Operable Units for the purpose of the RCRA Corrective Action Decision/Record of Decision (CAD/ROD).  
Buildings, fences, hydrography, roads and other structures from 1994 aerial fly-over data captured by ECHS Inc. are shown in light gray. Digitized from the Orthophotographs, 1/95

NOTES:  
All IHSS and PAC's Boundaries are Approximate. For more detail, please contact Environmental Restoration (X4605) for the following document:  
Historical Release Report (HRR) September 2002 Annual Update



Scale = 1 : 4800  
1 inch represents 400 feet

State Plane Coordinates Projection  
Contour Interval  
Datum: NAD27

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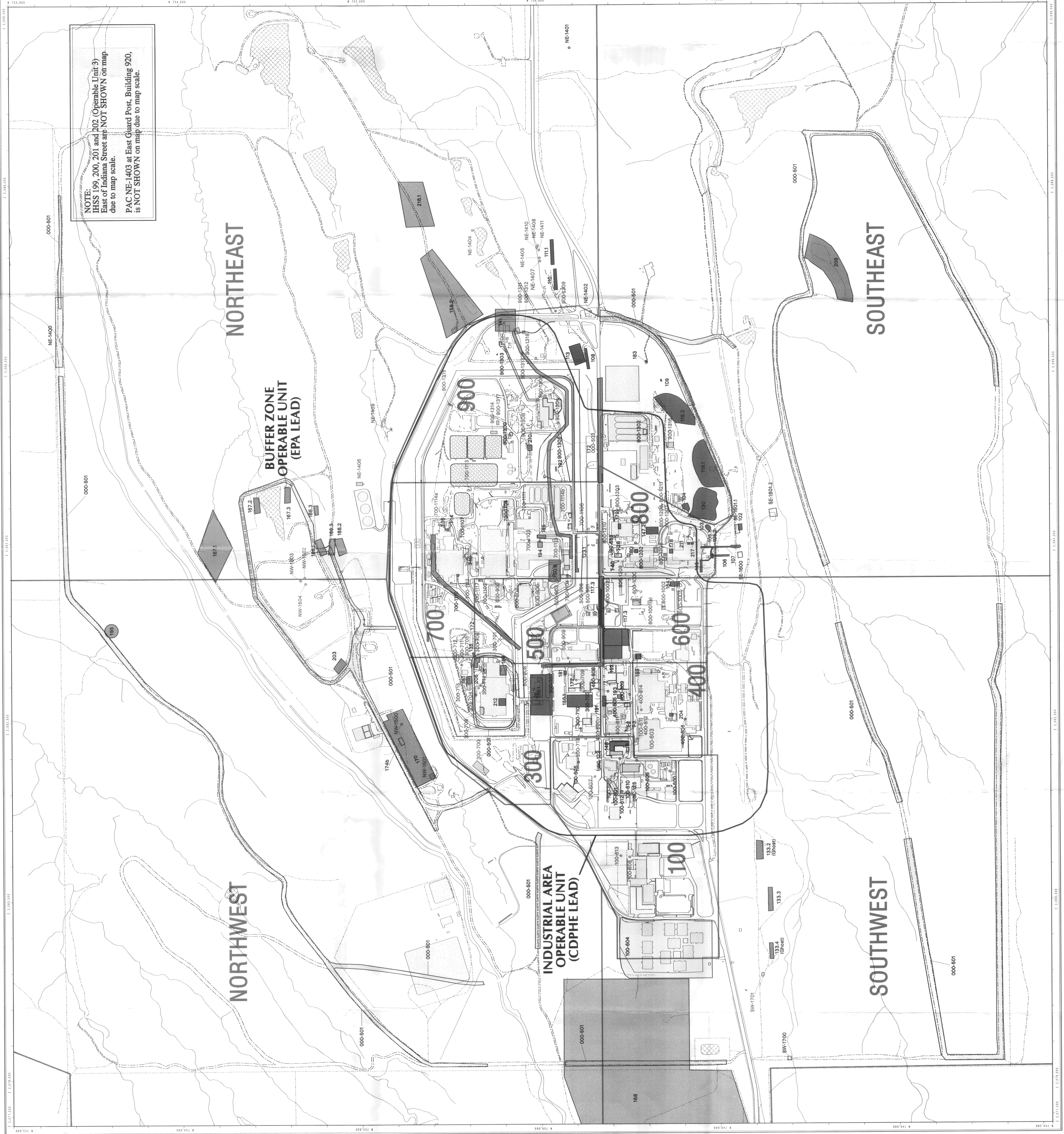
GIS Dept. 303-966-7707

Prepared for:

**DynCorp**  
THE ART OF TECHNOLOGY



September 27, 2002













# SOUTHEAST

**Plate 4**  
**Potential Areas of**  
**And Under Building Contamination**  
**(As of Sept. 2001)**

EXPLANATION	
UBC-559	Under Building Contamination Site
900-1310	Potential Area of Concern
400-813	Potential Area of Concern Point Spill (not to scale)

## Standard Map Features

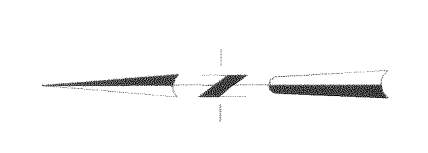
- |   |  |
|---|--|
|  | Buildings and other structures               |
|  | Solar Evaporation Ponds (SEPs)               |
|  | Lakes and ponds                              |
|  | Streams, ditches, or other drainage features |
|  | Fences and other barriers                    |
|  | Paved roads                                  |
|  | Dirt roads                                   |
|  | HRR Designation Area Boundary                |

**DATA SOURCE BASE FEATURES:**  
Individual Hazardous Substance Sites (IHSSs)  
DOE, 1992, HRR Report and Subsequent Updates.  
Buildings, fences, hydrography, roads and other  
structures from 1994 aerial fly-over data  
captured by EG&G RSL, Las Vegas.  
Digitized from the orthophotographs. 1/95

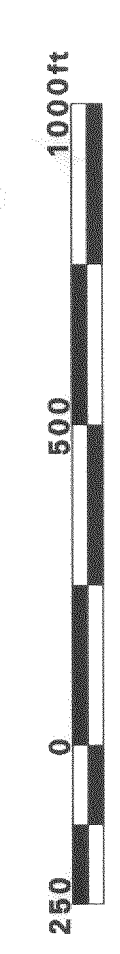
**NOTES:**

ALL IHSS and PAC's Boundaries are Approximate. For more detail, please contact Environmental Restoration(X4605) for the following document:

Historical Release Report (HRR) September 2002 Annual Update



Scale = 1 : 3600  
1 inch represents 300 feet

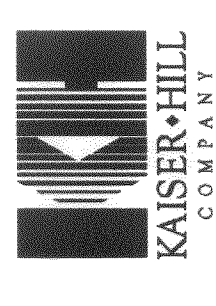


State Plane Coordinate Projection  
Colorado Central Zone  
Datum: NAD27

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September 30, 2002